

(11) **EP 1 854 694 A3**

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3: 12.03.2008 Bulletin 2008/11

(51) Int Cl.: **B61D** 15/06^(2006.01) **B62D** 21/15^(2006.01)

B61D 17/06 (2006.01)

(43) Date of publication A2: **14.11.2007 Bulletin 2007/46**

(21) Application number: 06256332.5

(22) Date of filing: 13.12.2006

(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 LV MC NL PL PT RO SE SI SK TR

Designated Extension States:

AL BA HR MK RS

(30) Priority: 10.05.2006 JP 2006131260

(71) Applicant: Hitachi, Ltd. Chiyoda-ku Tokyo 100-8220 (JP)

(72) Inventors:

 Kawasaki, Takeshi, c/o Hitachi Ltd. Chiyoda-ku, Tokyo 100-8220 (JP) Yamaguchi, Takashi, c/o Hitachi, Ltd. Chiyoda-ku, Tokyo 100-8220 (JP)

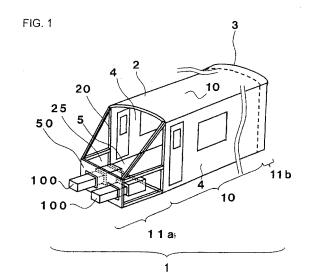
 Mochida, Toshihiko, c/o Hitachi, Ltd. Chiyoda-ku, Tokyo 100-8220 (JP)

 Yamamoto, Takahisa, c/o Hitachi, LTd. Chiyoda-ku Tokyo 100-8220 (JP)

 (74) Representative: Paget, Hugh Charles Edward et al Mewburn Ellis LLP York House
 23 Kingsway London WC2B 6HP (GB)

(54) Railway vehicle with energy absorbing structure

(57)For a transportation machine such as a railway vehicle, a space for a driver is secured while collision energy is absorbed at a time of collision with a large obstacle, and entry of a flying object into a driving cab is prevented by a rigid structure at a time of collision with the flying object. Windows (40) are provided in a flying object barrier plate (50) provided at a tip end portion of a driving cab (25), and energy absorbing members (100) are penetrated through the windows to be disposed in a form extending outward of the flying object barrier plate from an inside of the driving cab. The energy absorbing members of a large absorbing capacity can be efficiently disposed by utilizing a space of the driving cab provided in a vehicle body. A beam member of a crushable zone (11a) including the flying object barrier plate is firmly placed and can be connected to a survival zone (10).



EP 1 854 694 A3



EUROPEAN SEARCH REPORT

Application Number EP 06 25 6332

	DOCUMENTS CONSID					
Category	Citation of document with i of relevant pass	ndication, where appropriate, ages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)		
Х	EP 1 215 098 A (ALS 19 June 2002 (2002- * paragraphs [0011] figures 1-4 *		1-6	INV. B61D15/06 B61D17/06 B62D21/15		
X Y	EP 0 795 450 A (DEU [DE]) 17 September	JTSCHE WAGGONBAU AG 1997 (1997-09-17)	1			
ĭ	* column 5, line 5	- line 18; figure 1 *	$\begin{vmatrix} 1 \\ \end{vmatrix}$			
Y	EP 1 422 118 A (SIE 26 May 2004 (2004-0 * paragraph [0004] figure 1 *		1			
Х	EP 0 802 100 A (ALS 22 October 1997 (19 * figures 2-7 *		1,3			
Α	US 3 899 047 A (MAI 12 August 1975 (197 * column 17, line 9 figures 17a,b,c,d,e	75-08-12) 55 - column 20, line 53;	1-6	TECHNICAL FIELDS SEARCHED (IPC) B61D B61F F16F		
A	EP 0 655 565 A (GEO [FR]) 31 May 1995 (* the whole documer	C ALSTHOM TRANSPORT SA (1995-05-31)	1-6			
	The present search report has	been drawn up for all claims				
	Place of search	Date of completion of the search		Examiner		
Munich		28 January 2008	28 January 2008 Wojs			
X : part Y : part docu A : tech O : non	ATEGORY OF CITED DOCUMENTS icularly relevant if taken alone icularly relevant if combined with anotoment of the same category nological background written disclosure mediate document	E : earlier patent do after the filing dat ther D : document cited i L : document cited fi	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 8: member of the same patent family, corresponding document			

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

EP 06 25 6332

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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

28-01-2008

Patent document cited in search report	Publication date	Patent family member(s)			Publication date
EP 1215098 A	19-06-2002	AT AU CA CN DE EG FR HK JP MO RUS	9716301 / 2364957 / 1368448 / 60109399 / 60109399 / 22817 / 2239111 / 2818224 /	B2 A A1 A1 T2 A T3 A1 A1 A2 A A1 A	15-04-2005 06-01-2005 20-06-2002 18-06-2002 11-09-2002 21-04-2005 19-01-2006 30-09-2003 16-09-2005 21-06-2002 28-09-2007 31-08-2003 14-08-2002 01-07-2002 19-06-2002 27-06-2004 20-06-2002
EP 0795450 A	17-09-1997	DE	19609995	A1 	18-09-1997
EP 1422118 A	26-05-2004	CA DE US	2449904 10254440 2004129169		21-05-2004 09-06-2004 08-07-2004
EP 0802100 A	22-10-1997	AT DE DE DK ES FR PT	69706597 69706597 802100 2161423	T D1 T2 T3 T3 T3 A1	15-09-2001 18-10-2001 11-07-2002 17-12-2001 01-12-2001 24-10-1997 30-01-2002
US 3899047 A	12-08-1975	FR GB IT	2181044 1419698 984307	Α	30-11-1973 07-01-1976 20-11-1974
EP 0655565 A	31-05-1995	CA DE DE FR JP US		D1 T2 A1 B2 A	26-05-1995 11-11-1999 31-05-2000 02-06-1995 11-01-2006 25-07-1995 03-12-1996

FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82