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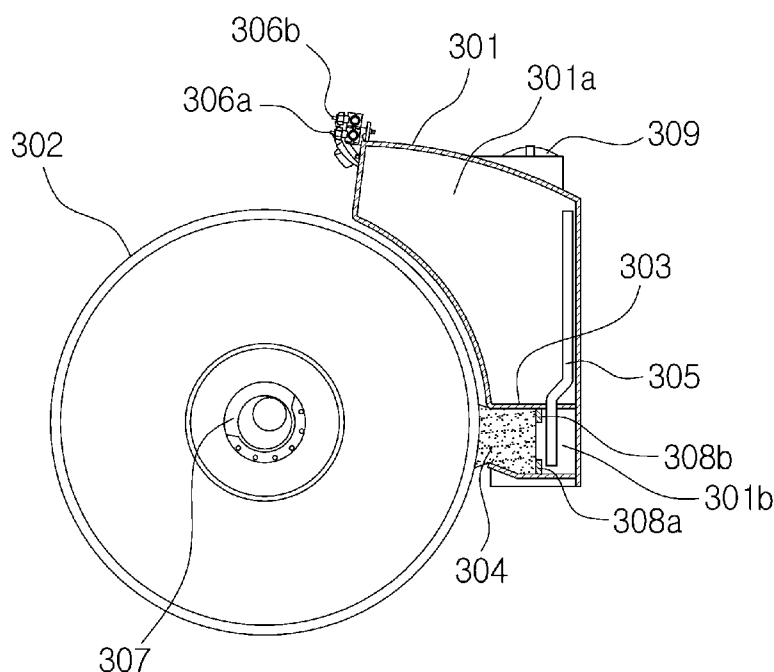
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY,
BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,
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- (54) **Title:** DEVICE FOR CLEANING THE DRUM SURFACE OF ASPHALT COMPACTORS



(57) **Abstract:** A device for cleaning a drum surface of an asphalt compactor is disclosed. The device has a water tank fixed to a body of the compactor, a partition member installed in the tank and dividing the tank into an upper main tank section and a lower secondary tank section. The front face of the secondary tank section has an opening plugged by a scraper made of a water absorbing, resilient and breathable material. The scraper is in contact with the surface of the drum. A tube installed between the upper main tank section and the lower secondary tank section. When the compactor is in use and the pump is activated, the water collected in the secondary tank section is recirculated to the main tank section through the tube and re-used. Also, water collected in the secondary tank can be used for other external usages by using a water tape or so.

Description

Title of Invention: DEVICE FOR CLEANING THE DRUM SURFACE OF ASPHALT COMPACTORS

Technical Field

[1] The present invention relates to asphalt compactors, and more particularly, to a device for recirculating water for cleaning the drum surface of asphalt compactors.

[2]

Background Art

[3] Asphalt compactors are mobile vehicles used to compact asphalt in the construction of roads and foundations. Such compactors are generally equipped with two steel drums, one at each end of the machine. It is required that the exterior surface of drums used on such asphalt compactors should be properly watered and cleaned to prevent adherence of particles or other material during their use.

[4]

[5] Water sprays and wipers are typically used for this purpose. Water sprays are to wet the drum surface, providing a coolant and lubricant to give protection, while wipers are to apply cleaning of the drum surface and to evenly distribute water across the drum surface. A partial coverage of water across the drum surface, occurring from a plugged or damaged water spray nozzle or through evaporation, causes a section of the drum surface to become dried. In that case, it is more likely that particles could adhere to the surface. This would jeopardize the finish requirements for the job and require rework of that section of the jobsite.

[6]

[7] FIG. 1 shows a typical drum surface lubricating and cleaning device used on asphalt compactors having a water spray 101 and a spring-loaded wiper 102 which is in contact with the surface of drum 103. Mounted on the frame is a water tank 104 joined to a pump (not shown) such that the pump is adapted to cause the water in the tank 104 to move into the spray 101 through a tube 105.

[8]

[9] In asphalt compactors a large quantity of water is used for cooling the drum and for preventing asphalt particles from sticking on the drum. For a continuous operation of the machine, water tank has to be refilled at a certain period of time, i.e., 2 to 3 hours. This will be very crucial in hard climate conditions and where there is a lack of water.

[10]

Disclosure of Invention

Technical Problem

[11] The present invention has been developed with attention paid to these problems encountered in the above-described related techniques. Therefore, the objects of the present invention include providing a device for cleaning the drum surface of asphalt compactors wherein the water wastage can be reduced, refilling period is longer, and eventually the machine can run continuously for longer hours.

[12]

Solution to Problem

[13] In order to achieve the aforementioned objects, the present invention employs the following arrangement.

[14]

[15] According to one aspect of the present invention, there is provided a device for cleaning a drum surface of an asphalt compactor which has a water tank fixed to a body of the compactor, and a partition member installed in the tank and dividing the tank into an upper main tank section and a lower secondary tank section.

[16]

[17] The lower secondary tank section has an opening formed at the front face facing to the drum, while all other sides are closed and air-tight. The opening of the secondary tank section is tightly plugged by a scraper which is made of water absorbing, resilient and breathable material, including some water absorbing polymers or organic sponge like material such as Cocomat made from coir of coconut husks. The scraper is in contact with the drum surface.

[18]

[19] Installed between the upper main tank section and the lower secondary tank section is a tube. The tube enables the upper main tank section to communicate with the lower secondary tank section.

[20]

[21] It is preferable that the tube extends from the bottom of the lower secondary tank section to the top of the upper main tank section.

[22]

[23] It is preferable that the floor of the secondary tank section is tapered toward the opened front face.

[24]

Advantageous Effects of Invention

[25] According to the present invention, the water spreads on the drum and flows over the drum to come in contact with the scraper which will then absorb the water. Because of the tapered shape of the bottom of the secondary tank section, excess water in the scraper slowly leaks and it will be collected in the secondary tank section. Since this

collected water can be reused, refilling period is longer, and eventually the machine can run continuously for longer hours.

[26]

Brief Description of Drawings

[27] FIG. 1 is a perspective view of a typical drum surface lubricating and cleaning device used on asphalt compactors;

[28] FIG. 2 is a schematic side view of the entire configuration of an asphalt compactor;

[29] FIG. 3a is a perspective view of a drum surface cleaning device according to an embodiment of the invention; and

[30] FIG. 3b is a section view of a drum surface cleaning device according to an embodiment of the invention

[31]

Best Mode for Carrying out the Invention

[32] Reference will now be made in detail to embodiments of the present invention, examples of which are illustrated in the accompanying drawings. While the present invention will be described in conjunction with the following embodiments, it will be understood that they are not intended to limit the present invention to these embodiments alone. On the contrary, the present invention is intended to cover alternatives, modifications, and equivalents which may be included within the spirit and scope of the present invention as defined by the appended claims. Furthermore, in the following detailed description of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, embodiments of the present invention may be practiced without these specific details.

[33]

[34] FIG. 2 illustrates the schematic configuration of an entire asphalt compactor. As shown in FIG. 2, a compactor 201 is composed of a front drum 202, a rear drum 203, a front body 204 and a rear body 205. A driver's seat 206 is mounted either on front body 204 or on rear body 205. Two bodies 204, 205 are connected with each other by means of a pivot joint 207 so the vehicle can be steered. Water sprays 208a, 208b and wipers 209a, 209b are provided for front drum 202 and rear drum 203, respectively.

[35]

[36] FIG. 3a and 3b illustrate a drum surface cleaning device of asphalt compactors according to one embodiment of the present invention.

[37]

[38] Referring to FIG. 3a and 3b, a water tank 301 is fixed to a body of the compactor adjacent to a drum 302. The width of the water tank 301 is similar to that of the drum

302. A partition member 303 is installed in the water tank 301. The partition member 303 divides the tank 301 into an upper main tank section 301a and a lower secondary tank section 301b. It is preferable that the secondary tank section 301b is constructed as an integral part of the tank 301. The tank 301 is generally air tight except for the front face of the secondary tank section 301b facing to the drum 302. The front face of the secondary tank section 301b has an opening. The opening is tightly plugged by a scraper 304.

[39]

[40] The scraper 304 is made of water absorbing, resilient and breathable material, including some water absorbing polymers or organic sponge like material such as Cocomat made from coir of coconut husks.

[41]

[42] The outer end of the scraper 304 is exposed and resiliently contacts the surface of the drum 302. As the width of the water tank 301 is similar to that of the drum 302, the scraper 304 is made to cover the entire width of the drum 302 as well. Protrusions 308a, 308b are formed on the floor and on the ceiling of the secondary tank section 301b, respectively, in order to securely put the inner end of the scraper 304 on a regular position.

[43]

[44] The floor of the secondary tank section 301b is tapered toward the opened front face. That is, the floor of the secondary tank section 301b has an uphill slope toward the opened front face.

[45]

[46] A tube 305 is installed between the upper main tank section 301a and the lower secondary tank section 301b. The tube 305 enables the upper main tank section 301a to communicate with the lower secondary tank section 301b. The tube 305 extends from the bottom of the lower secondary tank section 301b to the top of the upper main tank section 301a. Due to such design of the tube 305, the flow of water from the upper main tank section 301a to the lower secondary tank section 301b is prevented. Namely, water can only flow from the lower secondary tank section 301b to the upper main tank section 301.

[47]

[48] Reference numerals 306a, 306b are water spray nozzles installed on a water spray tube extending along the width of drum 302.

[49]

[50] Reference numeral 307 is an eccentric weight installed in the drum 302 to give a vibratory impact when the drum 302 rotates.

[51]

[52] Reference numeral 309 is a water filling cap.

[53]

[54] In an initial state of use, the tank 301, particularly the upper main tank section 301a, is filled with water. Once compacting operation is started, the drum 302 rotates and the water pump (not shown) is activated to cause the water in the tank 301 to move to the spray nozzles 306a, 306b. The sprayed water flows over the surface of the drum 302, and comes in contact with the scraper 304.

[55]

[56] Then, a part of water spread over the drum 302 is absorbed by the scraper 304 made of water absorbing material. Because of the vibratory motion of the drum 302 which forces the scraper 304 to compress and the tapered shape of the floor of the secondary tank section 301b, the excess water absorbed in the scraper 304 slowly leaks and is collected in the secondary tank section 301b.

[57]

[58] The water collected in the secondary tank section 301b is recirculated to the main tank section 301a through the tube 305 when the pump is activated. Namely, the tank 301 is being kept airtight except for the opened front face of the secondary tank section 301b which is plugged by the scraper 304. Since the scraper 304 is breathable, the pump generates a suction force which forces the water collected in the secondary tank section 301b to flow into the main tank section 301a.

[59]

[60] In this manner, water can be recirculated and reused. Consequently, refilling period is longer, and the machine can run continuously for longer hours. Additionally, water collected in the secondary tank can be used for other external usages by using a water tape or so.

[61]

[62] It should be noted that the drum surface cleaning devices according to the present invention are not limited to asphalt compactors shown in the embodiments, but can be widely used for various road surface compacting machinery.

[63]

[64] Although the invention has been described with reference to the preferred embodiments in the attached figures, it is noted that equivalents may be employed and substitutions made herein without departing from the scope of the invention as recited in the claims.

[65]

Industrial Applicability

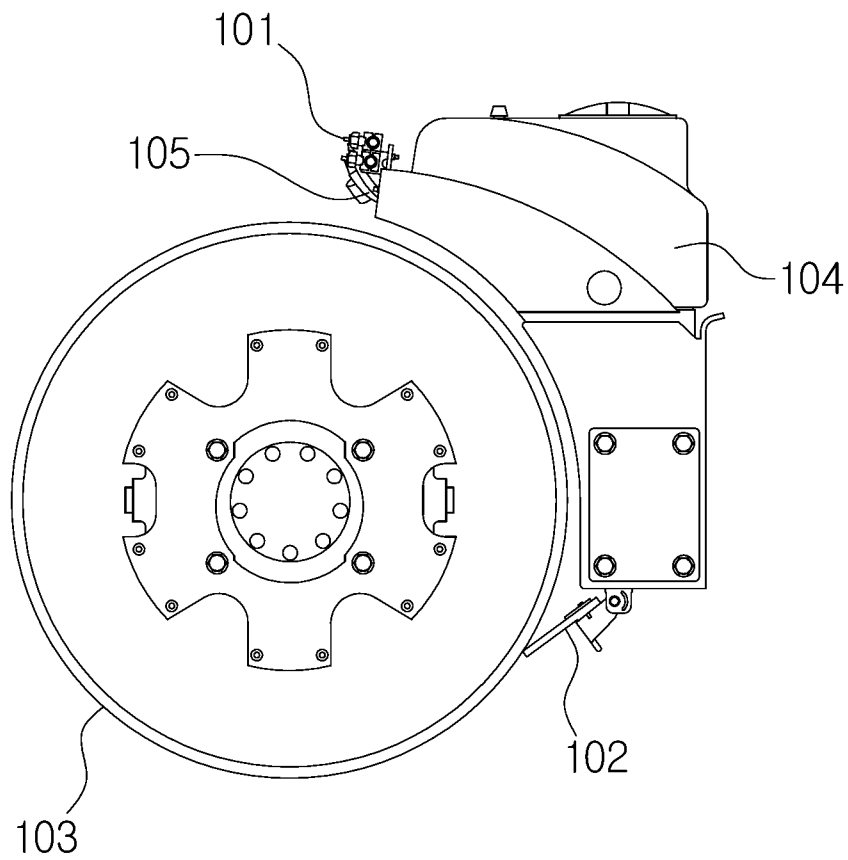
[66] The device for cleaning a drum surface of an asphalt compactor according to the

present invention is useful in a compaction machine wherein the water wastage can be reduced, refilling period is longer, and eventually the machine can run continuously for longer hours.

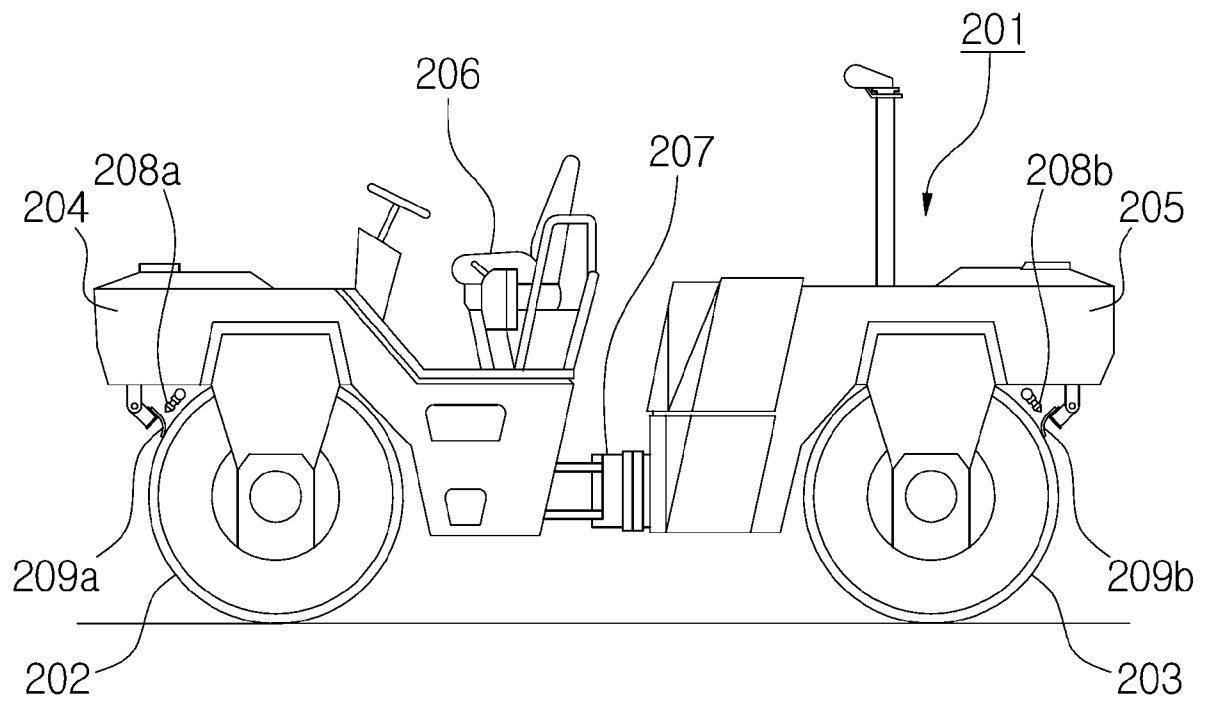
Claims

- [Claim 1] A device for cleaning a drum surface of an asphalt compactor, comprising:
a water tank fixed to a body of the compactor;
a partition member installed in the tank and dividing the tank into an upper main tank section and a lower secondary tank section, the lower secondary tank section having an opening facing to the surface of the drum;
a scraper plugging the opening, the scraper being made of a water absorbing, resilient and breathable material, the outer end of the scraper being in contact with the surface of the drum; and
a tube installed between the upper main tank section and the lower secondary tank section, whereby the water collected in the secondary tank section is recirculated to the main tank section through the tube and reused.
- [Claim 2] The device of claim 1, wherein:
the scraper is made of an organic sponge like material.
- [Claim 3] The device of claim 1, wherein:
the tube extends from the bottom of the lower secondary tank section to the top of the upper main tank section.
- [Claim 4] The device of claim 1, wherein:
the tube extends from the bottom of the lower secondary tank section to the top of the upper main tank section.
- [Claim 5] The device of claim 1, wherein:
the floor of the secondary tank section is tapered toward the opened front face of the secondary tank section.
- [Claim 6] The device of claim 1, further comprising: the floor of the secondary tank section further comprising:
protrusions formed on the floor and on the ceiling of secondary tank section, respectively to secure the scraper on a regular position in the secondary tank section.
- [Claim 7] The device of claim 1, wherein:
the drum has an eccentric weight to generate a vibratory motion when it rotates.

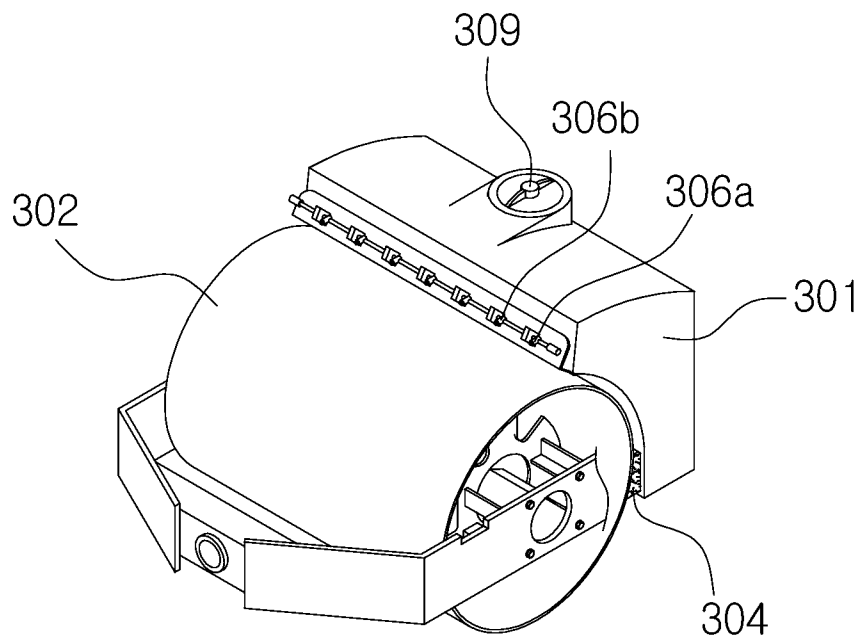
[Fig. 1]



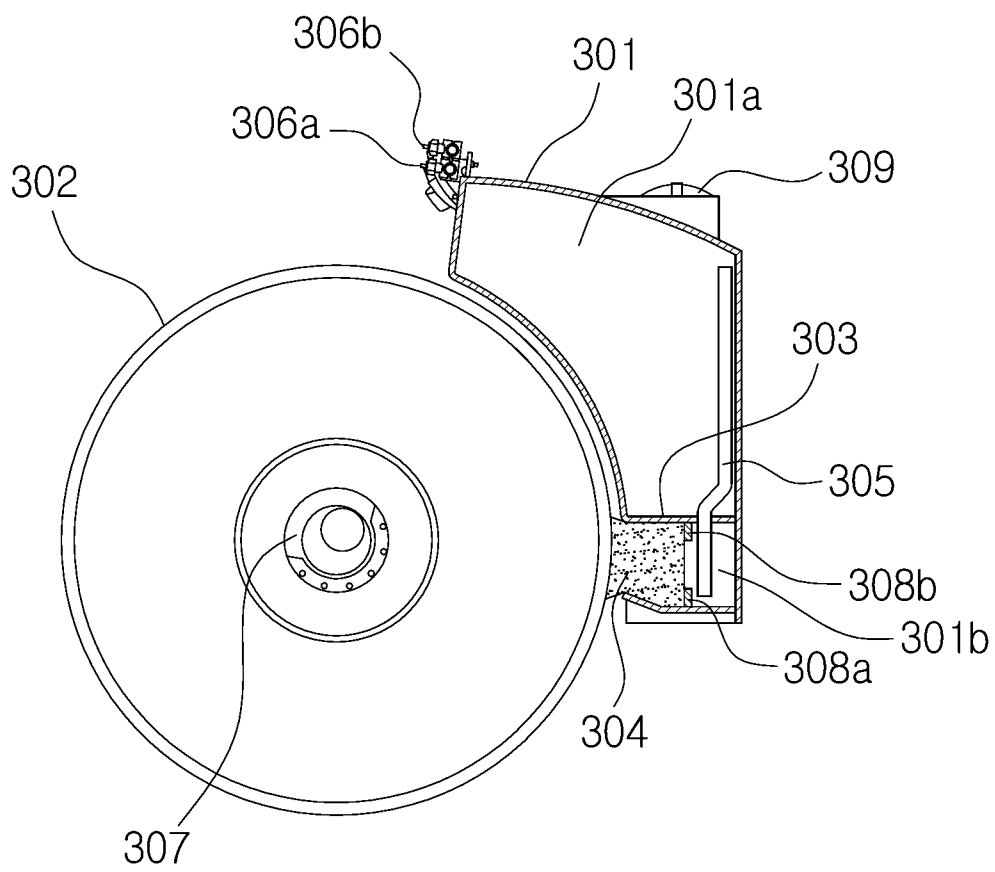
[Fig. 2]



[Fig. 3a]



[Fig. 3b]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2014/006968**A. CLASSIFICATION OF SUBJECT MATTER****B08B 1/00(2006.01)i, E01C 19/23(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
B08B 1/00; E01C 19/28; E01C 19/26; E01C 19/23; B05B 9/06; G01C 19/26; B60B 19/12Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: compactor, drum, clean, water, tank, scraper, wiper and tube**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5222828 A (MAGALSKI, EDWARD D.) 29 June 1993 See abstract, column 2, lines 65-68, column 3, lines 1-36 and figure 3.	1-7
A	JP 2011-001771 A (HITACHI CONSTR MACH CO., LTD.) 06 January 2011 See abstract, paragraphs [0008], [0020] and figure 4.	1-7
A	EP 1543197 B1 (VOLVO CONSTRUCTION EQUIPMENT AB) 30 January 2013 See paragraph [0025], claim 1 and figures 2, 4, 5.	1-7
A	JP 2010-077768 A (HITACHI CONSTR MACH CO., LTD.) 08 April 2010 See abstract, paragraphs [0016], [0017] and figure 1.	1-7
A	US 6206611 B1 (SCHRECK, MARTIN) 27 March 2001 See abstract, column 2, lines 7-23, claim 1 and figure 1.	1-7



Further documents are listed in the continuation of Box C.



See patent family annex.

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2014/006968

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5222828 A	29/06/1993	EP 0564607 A1 WO 93-09296 A1	13/10/1993 13/05/1993
JP 2011-001771 A	06/01/2011	JP 5054733 B2	24/10/2012
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