



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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| <b>(51) International Patent Classification <sup>6</sup>:</b><br><b>E21C 37/18, E21B 7/15, F42D 3/04</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>A1</b> | <b>(11) International Publication Number:</b> <b>WO 99/24694</b><br><b>(43) International Publication Date:</b> 20 May 1999 (20.05.99)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>(21) International Application Number:</b> PCT/NL98/00642<br><b>(22) International Filing Date:</b> 6 November 1998 (06.11.98)<br><b>(30) Priority Data:</b><br>1007467 6 November 1997 (06.11.97) NL<br><b>(71) Applicants (for all designated States except US):</b> BAGGER-<br>MAATSCHAPPIJ BOSKALIS B.V. [NL/NL]; Rosmolen-<br>weg 20, Postbus 43, NL-3350 AA Papendrecht (NL). BAL-<br>LAST NEDAM BAGGEREN B.V. [NL/NL]; Utrechtseweg<br>62, Postbus 149, NL-3700 AC Zeist (NL). HOLLAND-<br>SCHE AANNEMING MAATSCHAPPIJ B.V. [NL/NL];<br>Rivium Quadrant 2, NL-2909 LC Capelle aan der IJssel<br>(NL). VAN OORD ACZ B.V. [NL/NL]; Jan Blankenweg 2,<br>Postbus 458, NL-4200 AL Gorinchem (NL).<br><b>(72) Inventors; and</b><br><b>(75) Inventors/Applicants (for US only):</b> VLASBLOM, Willem,<br>Jacobus [NL/NL]; Kerverslaan 1a, NL-1911 SH Uitgeest<br>(NL). KOLKERT, Willem, Johannes [NL/NL]; Sowetostraat<br>24, NL-2622 LA Delft (NL).<br><b>(74) Agent:</b> FERGUSON, Alexander; Octrooibureau Vriesendorp &<br>Gaade, P.O. Box 266, NL-2501 AW The Hague (NL).                                                                                                                                                                                                                                                                                                                                                                |           | <b>(81) Designated States:</b> AL, AM, AT, AT (Utility model), AU, AZ,<br>BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility<br>model), DE, DE (Utility model), DK, DK (Utility model),<br>EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD,<br>GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR,<br>KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN,<br>MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK,<br>SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ,<br>VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD,<br>SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD,<br>RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK,<br>ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI<br>patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR,<br>NE, SN, TD, TG).<br><br><b>Published</b><br><i>With international search report.</i><br><i>In English translation (filed in Dutch).</i> |
| <b>(54) Title:</b> METHOD AND DEVICE FOR CRUSHING ROCK, MANIPULATOR TO BE USED IN SUCH A DEVICE, ASSEMBLY<br>OF A HOUSING AND A WIRE CONDUCTOR PLACED THEREIN, AND ASSEMBLY OF A HOUSING AND A MEANS<br>PLACED THEREIN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>(57) Abstract</b><br><p>Method for crushing rock comprising the generation of a shock wave with a preprogrammed form, strength and length of time for crushing rock. The preprogrammed form, strength and length of time are generated by means of pulsed electric energy. One or more sparking plugs, at least two electrodes or a wire conductor are used for generating the shock wave. Method for underwater dredging in which such a method is used. The shock wave has such a preprogrammed form, strength and length of time that the crushing of rock produces a desired size of pieces. Device for crushing rock comprising a wire conductor, means for bringing the wire conductor in the proximity of the rock and a device for supplying pulse-shaped electric energy to the wire conductor, with a quantity to have the wire conductor exploded for generating a shock wave with a preprogrammed form, strength and length of time for crushing rock. Manipulator to be used in a device for repetitively supplying new wire conductor. Assembly of a housing and a wire conductor or sparking plug placed therein, further comprising means for supplying pulsed electric energy to the wire conductor or sparking plug for generating a shock wave with a preprogrammed form, strength and length of time, the wire conductor or the sparking plug and the housing having such a configuration that the shock wave is aimed.</p> |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |