

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
3 March 2005 (03.03.2005)

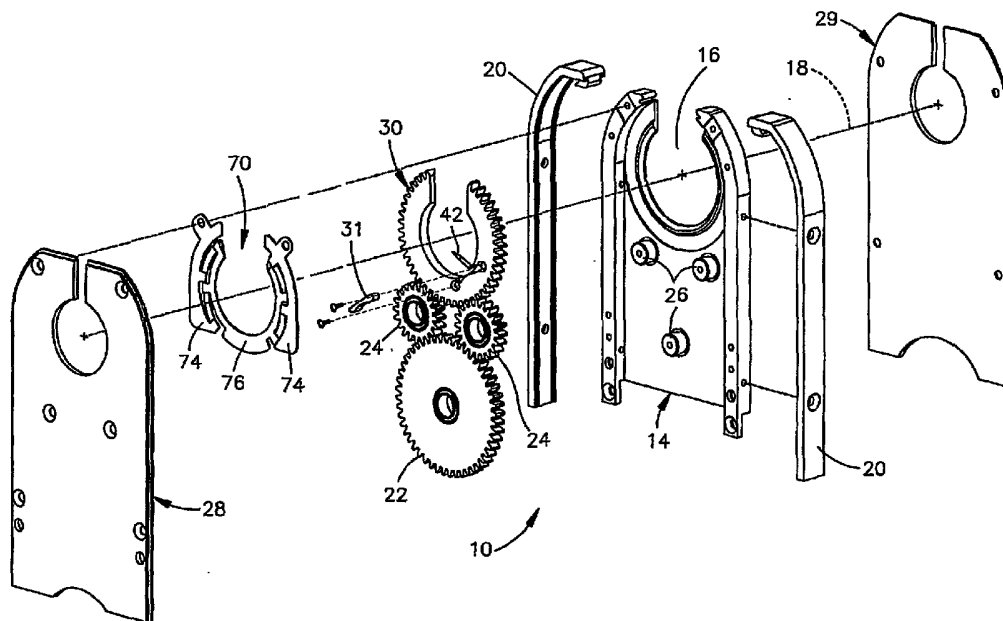
PCT

(10) International Publication Number
WO 2005/018862 A3

- (51) International Patent Classification⁷: **B23K 9/028**
- (21) International Application Number:
PCT/US2004/025763
- (22) International Filing Date: 10 August 2004 (10.08.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/481,216 12 August 2003 (12.08.2003) US
- (71) Applicant (for all designated States except US):
SWAGELOK COMPANY [US/US]; 29500 Solon Road, Solon, Ohio 44139 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **OYSTER, Peter** [US/US]; 2107 Marhofer Avenue, Stow, Ohio 44224 (US). **AMES, Nathaniel** [US/US]; 7910 Twin Hills Road, Streetsboro, Ohio 44241 (US). **MIZER, Craig** [US/US]; 3530 Edgewood Drive, Stow, Ohio 44224 (US). **HORVATH, Tom** [US/US]; 1476 Wilmar Road, Cleveland Heights, Ohio 44121 (US).
- (74) Agents: **LEWIS, Leonard, L.** et al.; 800 Superior Avenue, Suite 1400, Cleveland, Ohio 44114 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report

[Continued on next page]

(54) Title: ORBITAL WELD HEAD



(57) Abstract: An orbital weld head includes a metal insert and rotor. The covers are made from mica laminate. A metal spring/brush that is preferably one piece side loads the rotor against the insert. The rotor and insert have interengaging portions, preferably trapezoidal, that cause the rotor to move axially when it expands from heat, thus minimizing binding.

WO 2005/018862 A3



(88) Date of publication of the international search report:
15 September 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

PCT/US2004/025763

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 B23K9/028				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols) IPC 7 B23K				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US 5 223 686 A (BENWAY ET AL.) 29 June 1993 (1993-06-29) column 1, line 10 - line 12 column 6, line 30 - line 45 column 9, line 2 - line 4 column 9, line 14 - line 23 column 8, line 28 - line 35; figure 2a -----	1-8, 14-19, 24-30, 35-38		
A	US 5 710 403 A (JUSIONIS) 20 January 1998 (1998-01-20) column 2, line 42; figures 1a-1c ----- -/--	1-8, 14-19, 24-30, 35-38		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.				
<input checked="" type="checkbox"/> Patent family members are listed in annex.				
° Special categories of cited documents :				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; vertical-align: top;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family			
Date of the actual completion of the international search <p style="text-align: center; font-size: large;">10 February 2005</p>		Date of mailing of the international search report <p style="text-align: center; font-size: large;">24 06. 2005</p>		
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl. Fax: (+31-70) 340-3016		Authorized officer <p style="text-align: center; font-size: large;">Herbreteau, D</p>		

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/025763

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-8, 14-19, 24-30, 35-38

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8, 14-19, 24-30, 35-38

An orbital welding apparatus

2. claims: 1+(9-11), 14+(20, 21), 24+(31, 32), 46+(47, 48, 50-53)

an orbital welding apparatus comprising forth a metal spring/brush

3. claims: 1+(12, 13), 14+(22, 23), 24+(33, 34), 39-45, 46+ 49

An orbital welding apparatus comprising forth a mica laminate cover.

INTERNATIONAL SEARCH REPORT

PCT/US2004/025763

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 2003/111444 A1 (GUERRINA) 19 June 2003 (2003-06-19)</p> <p>the whole document -----</p>	<p>1-8, 14-19, 24-30, 35-38</p>

INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/US2004/025763

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5223686	A	29-06-1993	US 5136134 A	04-08-1992
			AT 160959 T	15-12-1997
			DE 69315631 D1	22-01-1998
			DE 69315631 T2	30-04-1998
			EP 0581535 A1	02-02-1994
			JP 3210496 B2	17-09-2001
			JP 6234073 A	23-08-1994
			KR 196448 B1	15-06-1999
			AT 137428 T	15-05-1996
			AT 192057 T	15-05-2000
			CA 2054558 A1	01-05-1992
			CA 2363050 A1	01-05-1992
			DE 69119189 D1	05-06-1996
			DE 69119189 T2	14-08-1996
			DE 69132150 D1	31-05-2000
			DE 69132150 T2	21-09-2000
			EP 0484125 A2	06-05-1992
			EP 0674967 A2	04-10-1995
			JP 3100199 B2	16-10-2000
			JP 5161969 A	29-06-1993
			KR 245172 B1	02-03-2000
US 5710403	A	20-01-1998	NONE	
US 2003111444	A1	19-06-2003	US 6459062 B1	01-10-2002