



AU9510370

(12) PATENT ABRIDGMENT (11) Document No. **AU-B-10370/95**  
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. **685548**

- (54) Title  
**DEVICE FOR CLEANSING WELDING TORCHES**
- International Patent Classification(s)  
(51)<sup>e</sup> **B23K 009/32**
- (21) Application No. : **10370/95** (22) Application Date : **26.10.94**
- (87) PCT Publication Number : **WO95/13162**
- (30) Priority Data
- |                |                 |                  |
|----------------|-----------------|------------------|
| (31) Number    | (32) Date       | (33) Country     |
| <b>9303665</b> | <b>08.11.93</b> | <b>SE SWEDEN</b> |
- (43) Publication Date : **29.05.95**
- (44) Publication Date of Accepted Application : **22.01.98**
- (71) Applicant(s)  
**SWEDTECH AB**
- (72) Inventor(s)  
**VALTER NILSSON**
- (74) Attorney or Agent  
**DAVIES COLLISON CAVE , 1 Little Collins Street, MELBOURNE VIC 3000**
- (56) Prior Art Documents  
**DE 3244993**  
**DD 233629**  
**DD 211505**
- (57) Claim

1. A device for automatically cleaning and cutting off the wire in the nozzles of MIG/MAG welding equipment, characterized in that the device, which is portable, comprises a centering member for insertion of a nozzle, and milling means to mill coated parts of the nozzle, as well as a cutting member for the foremost part of the welding bead of material applied, the milling means and cutting member being rotated by a drive means, designed to start automatically upon insertion of the nozzle.



II

AU9510370

.)

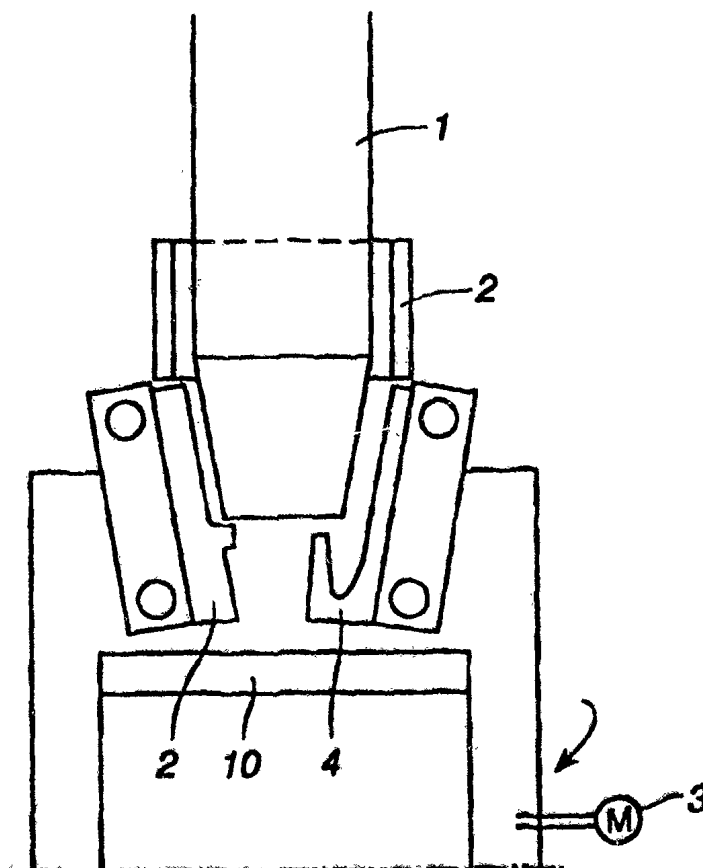
|                                                                                                               |  |                                                                                                                                                             |                                                             |
|---------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| (51) International Patent Classification <sup>6</sup> :<br><b>B23K 9/32</b>                                   |  | A1                                                                                                                                                          | (11) International Publication Number: <b>WO 95/13162</b>   |
|                                                                                                               |  |                                                                                                                                                             | (43) International Publication Date: 18 May 1995 (18.05.95) |
| (21) International Application Number: PCT/SE94/01007                                                         |  | (81) Designated States: AU, BR, CA, CN, FI, JP, KR, NO, <sup>1</sup> /JS, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). |                                                             |
| (22) International Filing Date: 26 October 1994 (26.10.94)                                                    |  |                                                                                                                                                             |                                                             |
| (30) Priority Data:<br>9303665-5 8 November 1993 (08.11.93) SE                                                |  | Published<br>With international search report.<br>With amended claims.<br>In English translation (filed in Swedish).                                        |                                                             |
| <del>(72)</del> Applicant and Inventor: NILSSON, Valter [SE/SE]; Lovisebergsvägen 12, S-722 19 Västerås (SE). |  |                                                                                                                                                             |                                                             |
| (74) Agent: BERGGREN, Björn; Långrevsgatan 1, S-723 49 Västerås (SE).                                         |  |                                                                                                                                                             |                                                             |
| (71) SWEDTECH AB<br><br>Ringborregatan 1<br>S- 721 34 Västerås<br>Sweden                                      |  | 685548                                                                                                                                                      |                                                             |



(54) Title: DEVICE FOR CLEANSING WELDING TORCHES

(57) Abstract

The present invention relates to a device for automatically cleaning and cutting off the wire in the nozzles of MIG/MAG welding equipment. It is characterized in that the device, which is portable, comprises a centering member (2) for insertion of a nozzle (1), and milling means (4, 5) to millcoated parts (6) of the nozzle, as well as possibly a cutting member (10) for the foremost part of the welding bead (7) of material applied, the milling means and cutting member if any (4, 5 and 10, respectively) being rotated by a drive means (3), designed to start automatically upon insertion of the nozzle (1).



Device for cleansing welding torches.

**Technical field:**

The present invention relates to a device for automatically cleaning and cutting off the wire in the nozzles of MIG/MAG welding equipment.

**Background art:**

When welding with automatic and semi-automatic welding equipment spraying and splashing occurs in the nozzle, thereby preventing a uniform flow of the protective gas used during electric arc welding. Unless this problem is remedied the welding quality will gradually deteriorate, resulting in welding defects.

When performing MIG/MAG welding manually, the welding is stopped at regular intervals and the welding sleeve (gas hood) is manually cleaned using files, knives or the like, and a special wire brush. The welding bead is then cut off to give a suitable tip. Lumps and thickened portions often occur at the tip, which should preferably be avoided. The aim is thus to prevent welding defects at the starting instant. A welding spray is applied to inhibit further coating. However, this welding spray does not completely prevent coating but only provides protection for a limited period.

In the case of automatic welding by robots the problem is greater since the welding process must be interrupted and sometimes the welding programme must be restarted after cleaning. A few specially designed cleaning machines are commercially available but it is difficult to fit them into the entire cleaning process, including spraying and bead cutting. No procedure that performs these steps simultaneously is commercially available. It is known per se to mill off such deposits, but not in combination with other necessary steps.

**Summary of the invention:**

The present invention aims at solving the above-mentioned and associated problems and is characterized in that the device, which is portable, comprises a centering member for insertion of a nozzle, and milling means to mill coated parts of the nozzle, as well as possibly a cutting member for

the foremost part of the welding bead of material applied, the milling means and cutting member if any being rotated by a drive means designed to start automatically upon insertion of the nozzle.

This equipment enables the time required for the entire cleaning and cutting process to be greatly reduced (to 4-5 seconds), while enabling this cleaning process to be introduced into the welding cycle at pre-programmed intervals.

**Brief description of the drawings:**

An example of the invention is illustrated in the accompanying drawings in which Figure 1 shows the device from the side, Figure 1 A a welding nozzle coated with welding deposits, Figures 2 and 3 two milling members, Figure 4 a cutting member and Figure 5 feedout means for waste material.

**Preferred embodiment:**

Figure 1 shows a welding nozzle (1) which is inserted into a centering member (2), whereupon a drive means (3) such as a pneumatic or electric motor starts and drives two or more milling means (4, 5).

Figure 1 A shows a welding nozzle (1) coated with inner and outer deposits (6). A welding bead (7), thickened or coated at the front end can also be seen in this figure.

The milling means (4, 5) are rotated around the nozzle (1) and are shaped both (Figure 1) for machining the inner deposits in the lower part of the nozzle and also (Figure 2) the outer deposits and deposits on the front of the nozzle (components 4 and 5, respectively, in Figures 1-3).

The invention also includes a cutting member (10) to simultaneously cut off the foremost part of the welding bead, see Figure 4. This cutting member is suitably rotated at the same time as the milling means, but may also rotate separately. It comprises two cutters, one which is fixed in radial direction (8) and one which is movable in radial direction (9). The movable cutter is influenced during the rotation by a cam disc (13) or the like towards and away from the fixed cutter (8), against the action of a spring (11). The front part of the bead (7) is thus cut off. Figure 5 shows a waste trough lowermost in the device (12), for material machined off.

The device operates as follows:

When the nozzle (1) has become coated ("dirty") it is inserted in the cleaner and the automatic milling means (4, 5) starts up and scrapes the nozzle clean and an exact length of the protruding welding bead is cut off. In the meanwhile welding spray is applied around the nozzle in order to prevent splashed welding material from adhering. The blast air is also utilized to blow the machine clean in order to prevent disturbances in operation.

The invention can be varied in many ways within the scope of the appended claims.

- 4 -

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A device for automatically cleaning and cutting off the wire in the nozzles of MIG/MAG welding equipment, characterized in that the device, which is portable, comprises  
5 a centering member for insertion of a nozzle, and milling means to mill coated parts of the nozzle, as well as a cutting member for the foremost part of the welding bead of material applied, the milling means and cutting member being rotated by a drive means, designed to start automatically upon insertion of the nozzle.
- 10 2. A device as claimed in claim 1, characterized in that the milling means are at least two in number, one for the inner exposed part of the nozzle and one primarily for its outer exposed part and its foremost part, milling occurring during the rotation.
3. A device as claimed in claim 1, characterized in that the cutting member consists of  
15 two cutters, one which is radially fixed and one which is movable to and from the cutting position with the aid of a cam disc or the like which influences this cutter during the rotation.
4. A device as claimed in any of the preceding claims, characterized in that a welding spray is arranged to be blown onto the nozzle during the cleaning process.
- 20 5. A device as claimed in any of the preceding claims, characterized in that the drive means consists of a pneumatic motor.
6. A device for automatically cleaning and cutting of the wire in the nozzles of  
25 MIG/MAG welding equipment substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 17th day of September, 1997

SWEDTECH AB

By its Patent Attorneys

DAVIES COLLISON CAVE



## AMENDED CLAIMS

[received by the International Bureau on 04 April 1995 (04.04.95);  
original claim 1 amended; remaining claims unchanged (1 page)]

1. A device for automatically cleaning and cutting off the wire in the nozzles of MIG/MAG welding equipment, characterized in that the device, which is portable, comprises a centering member (2) for insertion of a nozzle (1), and milling means (4, 5) to mill coated parts (6) of the nozzle, as well as a cutting member (10) for the foremost part of the welding bead (7) of material applied, the milling means and cutting member if any (4, 5 and 10, respectively) being rotated by a drive means (3), designed to start automatically upon insertion of the nozzle (1).
2. A device as claimed in claim 1, characterized in that the milling means (4, 5) are at least two in number, one (4) for the inner exposed part (6) of the nozzle and one primarily for its outer exposed part and its foremost part, milling occurring during the rotation.
3. A device as claimed in claim 1, characterized in that the cutting member (10) consists of two cutters (8, 9), one (8) which is radially fixed and one which is movable to and from the cutting position with the aid of a cam disc (13) or the like which influences this cutter during the rotation.
4. A device as claimed in any of the preceding claims, characterized in that a welding spray is arranged to be blown onto the nozzle during the cleaning process.
5. A device as claimed in any of the preceding claims, characterized in that the drive means consists of a pneumatic motor (1).

10370/95

Fig. 1

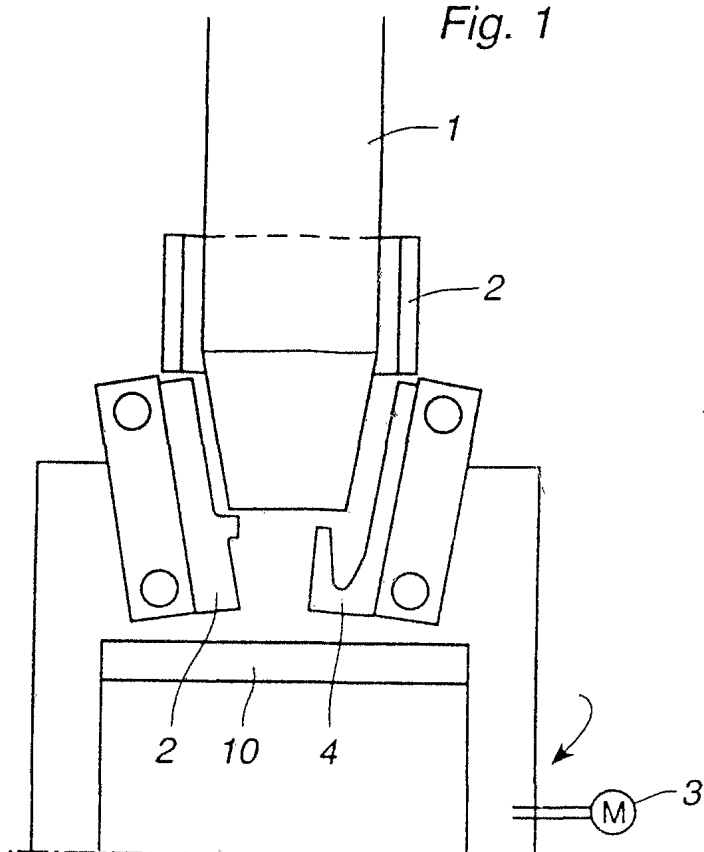


Fig. 1A

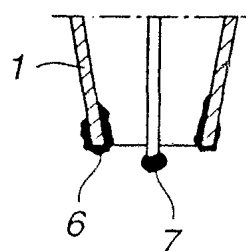


Fig. 2

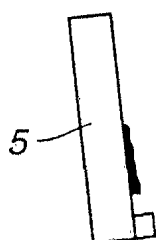


Fig. 3

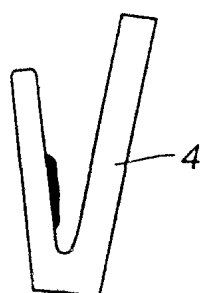


Fig. 4

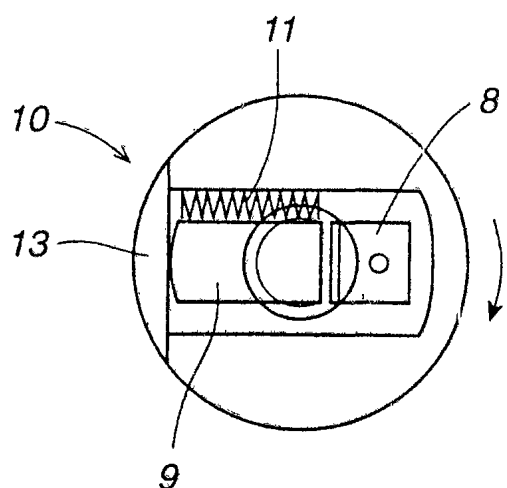
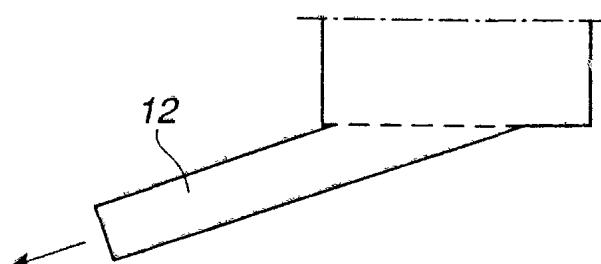


Fig. 5





## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/01007

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B23K 9/32

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)

IPC6: B23K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                 | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------|-----------------------|
| X         | DE, A1, 3244993 (BEHRENS, WERNER), 7 June 1984<br>(07.06.84), abstract                             | 1,5                   |
| Y         | ---                                                                                                | 2,4                   |
| Y         | DD, A1, 233629 (VEB ZENTRALWERKSTATT REGIS),<br>5 March 1986 (05.03.86), figures 1-2,<br>abstract  | 2                     |
| Y         | DD, 211505 (ZENTRALINSTITUT FUER SCHWEISSTECHNIK<br>DER DDR), 18 July 1984 (18.07.84),<br>abstract | 4                     |
|           | ---                                                                                                |                       |



Further documents are listed in the continuation of Box C.



See patent family annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "B" 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

22 February 1995

Date of mailing of the international search report

27 -02- 1995

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Anders Axberger  
Telephone No. +46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 94/01007

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages           | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------|-----------------------|
| Y         | DD, A1, 220688 (VEB VOLKSWERFT STRALSUND),<br>3 April 1985 (03.04.85), abstract<br><br>----- | 4                     |

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

09/02/95

International application No.  
PCT/SE 94/01007

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---------------------|----------------------------|---------------------|
| DE-A1- 3244993                            | 07/06/84            | NONE                       |                     |
| DD-A1- 233629                             | 05/03/86            | NONE                       |                     |
| DD- - 211505                              | 18/07/84            | NONE                       |                     |
| DD-A1- 220688                             | 03/04/85            | NONE                       |                     |