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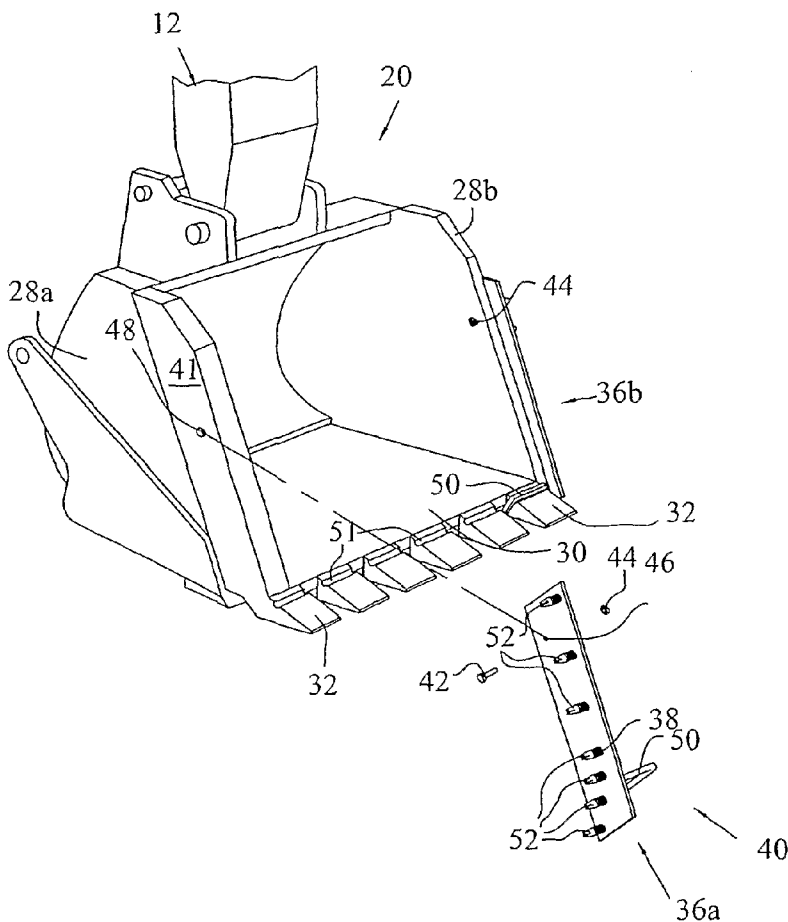
— with international search report

(88) Date of publication of the international search report:

1 March 2007

[Continued on next page]

(54) Title: TRENCH WALL RIPPER APPARATUS



(57) Abstract: An apparatus (36) coupled to an excavation bucket (20) for creating a trench (24) sidewall (28) having indentations (34) formed therein.

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*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

International application No  
PCT/US2006/012119

A. CLASSIFICATION OF SUBJECT MATTER

INV. E02F9/28 E21C35/193 E02F3/40 E02F5/32

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)  
E02F E21C

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 A	EP 0 280 003 A (SANTRADE LIMITED) 31 August 1988 (1988-08-31) column 2; figures -----	1,8 3,9
X A	US 2 353 685 A (ASKUE ALBERT R) 18 July 1944 (1944-07-18) page 2, left-hand column, line 59 - right-hand column, line 22; figures -----	1,2,8 3,9
A	US 4 896 444 A (SIEBER ET AL) 30 January 1990 (1990-01-30) the whole document -----	1
A	US 4 151 664 A (MAURA, NICHOLAS) 1 May 1979 (1979-05-01) figures -----	3,9
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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

"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

25 July 2006

Date of mailing of the international search report

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Name and mailing address of the ISA/

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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2006/012119

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 329 794 A (ROGERS ET AL) 18 May 1982 (1982-05-18) figures	3,9
A	----- US 4 457 085 A (ARNOLD ET AL) 3 July 1984 (1984-07-03) the whole document	
A	----- WO 00/55434 A (LEE SHEARSBY DODD LTD; DODD, ANDREW; LEE, SIU, KEUNG; SHEARSBY, MARK) 21 September 2000 (2000-09-21) the whole document -----	

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2006/012119

## 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.:

1-3, 8-9

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: 1-3,8-9

directed to a bucket and ripper apparatus (kit) in which the ripper kit is releasably secured to the bucket by means of a loop and an aperture;

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2. claims: 4-6,10-12,14

directed to a bucket and ripper apparatus (kit) in which a plurality of cutters are inserted in a mounting member by special means;

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3. claims: 7, 13, 15, 16

directed to a cutter (mountable on a mounting member which is mountable on the side wall of a bucket) having a special three-edge cutting portion supported by the base portion;

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2006/012119
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Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
EP 0280003	A	31-08-1988	AU 598521 B2 AU 6961187 A SE 8600239 A	28-06-1990 01-09-1988 22-07-1987
-----				
US 2353685	A	18-07-1944	NONE	
-----				
US 4896444	A	30-01-1990	NONE	
-----				
US 4151664	A	01-05-1979	NONE	
-----				
US 4329794	A	18-05-1982	AU 6758481 A ZA 8101330 A	01-10-1981 31-03-1982
-----				
US 4457085	A	03-07-1984	NONE	
-----				
WO 0055434	A	21-09-2000	AU 3305700 A GB 2347921 A	04-10-2000 20-09-2000
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