



(51) International Patent Classification:

A01G 23/06 (2006.01) B27G 13/10 (2006.01)
B02C 18/18 (2006.01)

(21) International Application Number:

PCT/US2019/017029

(22) International Filing Date:

07 February 2019 (07.02.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/627,377 07 February 2018 (07.02.2018) US
62/661,476 23 April 2018 (23.04.2018) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

(54) Title: CUTTER MOUNTING SYSTEMS AND CUTTERS FOR THE SAME

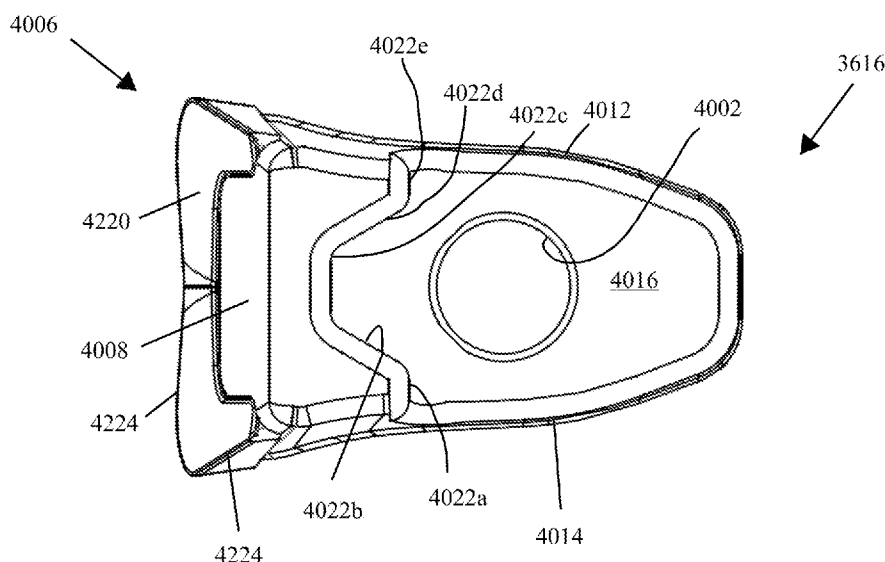


FIG. 45

(57) Abstract: A cutter includes a first end configured to engage an object along a dominant force vector, a second end opposite the first end, a first side, and a second side opposite the first side. The cutter further includes an outer side, an inner side, and an aperture extending from the outer side to the inner side along a fastener axis that is substantially perpendicular to the dominant force vector. The cutter also includes a cutter tip on the first end and having a first cutting edge, a second cutting edge, and a third cutting edge, the cutting edges defining therebetween a cutting face. The cutting face defines a cutting swath having a width between the first cutting edge and the second cutting edge as the cutter rotates with the apparatus. No portion of the first side or the second side extends outside the width of the cutting swath.



GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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

17 October 2019 (17.10.2019)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/017029

Box No. 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 No. 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 fees, this Authority did not invite payment of additional fees.
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.:

1, 9, 12-58
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.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/017029

A. CLASSIFICATION OF SUBJECT MATTER
INV. A01G23/06 B02C18/18 B27G13/10
ADD.

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)

A01G B23D B02C A01C B27G

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 practicable, 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 2014/196818 A1 (WEINBERG CLINT [US] ET AL) 17 July 2014 (2014-07-17)	1,9
A	paragraph [0014] - paragraph [0025]; figures 1-5	12-58
A	----- US 2006/102247 A1 (GREEN KEVIN J [US]) 18 May 2006 (2006-05-18) abstract; figures 1-4	1,9, 12-58
A	----- US 2015/136276 A1 (GREEN KEVIN [US] ET AL) 21 May 2015 (2015-05-21) abstract; figures 1-24	1,9, 12-58
A	----- WO 2009/025887 A1 (LEONARDI MFG CO [US]; LEONARDI JOSEPH [US]) 26 February 2009 (2009-02-26) abstract; figures 1-32	1,9, 12-58
	----- -/-	



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 application or patent 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

9 September 2019

Date of mailing of the international search report

17/09/2019

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/017029

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 2008/245440 A1 (PAUMIER JAMES J [US]) 9 October 2008 (2008-10-09) abstract; figures 1-18 -----	1,9, 12-58
A	US 2017/079219 A1 (STANLEY JEFFREY THOMAS [US] ET AL) 23 March 2017 (2017-03-23) abstract; figures 1-49 -----	1,9, 12-58
A	EP 1 833 647 B1 (IGGESUND TOOLS AB [SE]) 19 July 2017 (2017-07-19) abstract; figures 1-4 -----	1,9, 12-58

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2019/017029

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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, 9, 29-58

Cutter, cutter wheel and method

2. claim: 2

Cutter with variable swath

3. claims: 3-6

Cutter with leg portions

4. claims: 7, 8

Cutter with tapered body

5. claim: 10

Cutter with speical cutter tip and reaction surface portions

6. claim: 11

Cutter with a ledge

7. claims: 12-21

Cutter with reaction surface portions

8. claims: 22-28

Cutting assembly
