



(51) International Patent Classification:

B23K 26/00 (2014.01) B23K 26/364 (2014.01)

B23K 26/082 (2014.01) H01S 3/07 (2006.01)

B23K 26/352 (2014.01) H01S 3/223 (2006.01)

(21) International Application Number:

PCT/EP2024/065583

(22) International Filing Date:

06 June 2024 (06.06.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2308474.2

07 June 2023 (07.06.2023)

GB

(71) Applicant: ALLTEC ANGEWANDTE LASERLICHT

TECHNOLOGIE GMBH [DE/DE]; An der Trave 27-31,
23923 Selmsdorf (DE).

(72) Inventor: KUECKENDAHL, Peter J.; c/o Alltec Ange-

wandte Laserlicht Technologie GmbH, An der Trave 27-31,
23923 Selmsdorf (DE).

(74) Agent: MARKS & CLERK LLP; 15 Fetter Lane, London

EC4A 1BW (GB).

(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, CV, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG,
KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY,
MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA,

(54) Title: LASER MARKING HEAD, LASER MARKING SYSTEM WITH SUCH HEAD, METHOD OF MARKING A PRODUCT WITH CO₂ LASER, METHOD OF ASSEMBLING A MARKING HEAD, AND METHOD OF CONNECTING A CO₂ LASER AND A STEERING MECHANISM

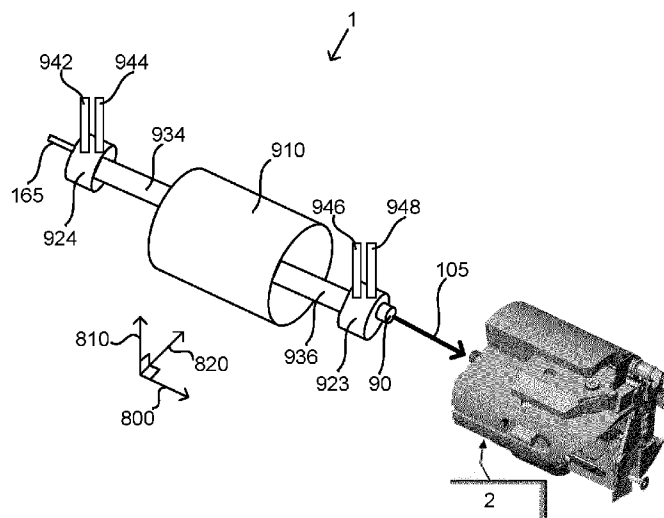


FIG. 1

(57) Abstract: The present application relates to a marking head for a laser marking system comprising a CO₂ laser source (1) configured to generate electromagnetic radiation, and an electromagnetic radiation steering mechanism (2) configured to steer the electromagnetic radiation to address a specific location within a two-dimensional field of view. The electromagnetic radiation steering mechanism (2) comprises an electromagnetic radiation manipulator configured to introduce a difference between a first angle defined between first and second rotational axes and a second angle defined between first and second steering axes. The CO₂ laser source (1) has a dimension in a first direction that is greater than a dimension of the CO₂ laser source (1) in either orthogonal





NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

- (84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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))
- in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE

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

16 January 2025 (16.01.2025)

direction to the first direction. The marking head has a dimension in the first direction that is greater than a dimension of the marking head in either orthogonal direction to the first direction.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/065583

A. CLASSIFICATION OF SUBJECT MATTER		
INV.	B23K26/00	B23K26/082 B23K26/352 B23K26/364 H01S3/07
	H01S3/223	
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)		
B23K H01S		
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, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2007 061849 A (SUNX LTD) 15 March 2007 (2007-03-15) abstract paragraphs [0024], [0064]; figures -----	1 - 46
Y	WO 2019/101887 A1 (ALLTEC ANGEWANDTE LASERLICHT TECH GMBH [DE]) 31 May 2019 (2019-05-31) cited in the application paragraphs [0181] - [0182], [0188] [0189]; figures; example -----	1 - 46
Y	US 2019/267768 A1 (W. WEINGARTNER) 29 August 2019 (2019-08-29) paragraphs [0039] - [0042]; figures -----	17 - 21
Y	US 2012/219028 A1 (C. E. MORROW ET AL) 30 August 2012 (2012-08-30)	18, 21
A	paragraph [0027]; figures -----	17, 19, 20
☐ 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		Date of mailing of the international search report
22 November 2024		05/12/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Jeggy, Thierry

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2024/065583

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2007061849 A	15-03-2007	JP 4614443 B2	19-01-2011
		JP 2007061849 A	15-03-2007

WO 2019101887 A1	31-05-2019	CN 111727102 A	29-09-2020
		CN 111788513 A	16-10-2020
		CN 117452624 A	26-01-2024
		EP 3713706 A2	30-09-2020
		EP 3714310 A1	30-09-2020
		EP 4353398 A2	17-04-2024
		ES 2973658 T3	21-06-2024
		JP 7267292 B2	01-05-2023
		JP 7547549 B2	09-09-2024
		JP 2021504150 A	15-02-2021
		JP 2021504765 A	15-02-2021
		JP 2023099538 A	13-07-2023
		PL 3714310 T3	29-04-2024
		US 2020371346 A1	26-11-2020
		US 2021291573 A1	23-09-2021
		US 2024140123 A1	02-05-2024
		WO 2019101886 A2	31-05-2019
		WO 2019101887 A1	31-05-2019

US 2019267768 A1	29-08-2019	CN 109906534 A	18-06-2019
		EP 3516745 A1	31-07-2019
		US 2019267768 A1	29-08-2019
		WO 2018057567 A1	29-03-2018

US 2012219028 A1	30-08-2012	CN 103518295 A	15-01-2014
		CN 107134708 A	05-09-2017
		EP 2673855 A2	18-12-2013
		ES 2593806 T3	13-12-2016
		US 2012219028 A1	30-08-2012
		WO 2012115939 A2	30-08-2012
