

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
26 February 2004 (26.02.2004)

PCT

(10) International Publication Number
WO 2004/017110 A3

(51) International Patent Classification⁷: **B26F 1/40**,
G02B 6/00, B30B 15/00, B21D 37/12

(21) International Application Number:
PCT/US2003/025939

(22) International Filing Date: 18 August 2003 (18.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/403,924 16 August 2002 (16.08.2002) US
60/403,925 16 August 2002 (16.08.2002) US
60/403,926 16 August 2002 (16.08.2002) US
10/620,851 15 July 2003 (15.07.2003) US

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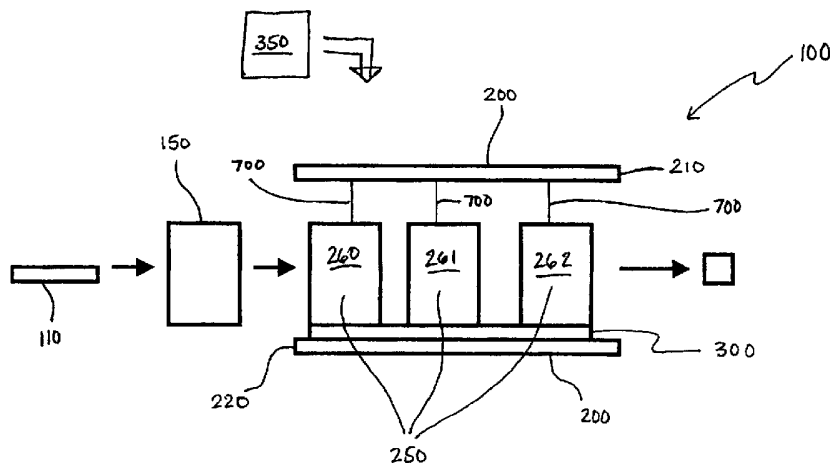
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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,
SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: STAMPING SYSTEM FOR MANUFACTURING HIGH TOLERANCE PARTS



(57) Abstract: A system and process for stamping parts having tolerances below 1000 nanometers. The inventive system and process is particularly suited for producing optoelectronic parts. The system includes a stamping press and one or a progression of stamping stations for supporting a punch and die. The stamping stations are designed to maintain substantial alignment of the punch and die with minimal moving components. The stamping station includes a shaft for rigidly guiding the punch to the die. The stamping press is capable of providing the punch with the necessary force to perform the stamping operations. The system includes an interface system for interfacing the force of the press with the punch, while simultaneously structurally decoupling the press from the punch. The system also includes a locating sub-plate, for locating the stamping station in alignment relative to each other, and means for in-line machine stock material before entry into the stamping stations.



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

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

6 January 2005

(15) Information about Correction:**Previous Correction:**

see PCT Gazette No. 35/2004 of 26 August 2004, Section II

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/US 03/25939

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 B26F1/40 G02B6/00 B30B15/00 B21D37/12		
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 B26F G02B B30B B21D B21C		
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 3 568 555 A (STROH WERNER H) 9 March 1971 (1971-03-09)	1,4,10
Y	abstract; figure 1	7-9,18
A		2,3,5,6, 11-17, 19-28
X	US 6 311 597 B1 (ROONEY THOMAS ET AL) 6 November 2001 (2001-11-06)	1-4, 7-12,20
Y	column 1, line 35 - line 40; figures 1-3	13-18, 21-28
A		5,6,19
Y	US 3 861 192 A (SUZUKI TAKAMITSU ET AL) 21 January 1975 (1975-01-21)	7-9
A	figure 1	1-6, 10-28
	----- -/--	
☒ Further documents are listed in the continuation of box C. ☒ Patent family members are listed in 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) "C" 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 17 August 2004		Date of mailing of the international search report 01.09.2004
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 Wimmer, M

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/25939

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 287 986 A (USHIO KOGYO CO) 26 October 1988 (1988-10-26)	1-7
Y	figures 7,8	8-10
A	-----	11-28
X	US 6 122 952 A (RUPP JOSEPH J ET AL) 26 September 2000 (2000-09-26)	1-6
Y	abstract; figures 1-3	21,22, 24-28
A	columns 5,6	7-20,23
Y	----- US 3 709 083 A (DOHERTY N) 9 January 1973 (1973-01-09)	10,13
A	figure 2	1-9,11, 12,14-28
Y	----- US 4 030 336 A (GRIGORENKO ANATOLY SERGEEVICH ET AL) 21 June 1977 (1977-06-21)	14-17
A	the whole document	1-13, 18-28
Y	----- US 2 336 982 A (DORLAND CREMER GEORGE) 14 December 1943 (1943-12-14)	8,9
A	figure 1	1-7, 10-28
Y	----- US 4 926 677 A (WALDNER KURT) 22 May 1990 (1990-05-22)	23
A	figures 1,3,4	1-22, 24-28
A	----- EP 0 410 181 A (PIRELLI CAVI SPA) 30 January 1991 (1991-01-30)	1-28
A	the whole document	
A	----- WO 98/15381 A (TYCO SUBMARINE SYSTEMS LTD) 16 April 1998 (1998-04-16)	1-28
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 03/25939

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

see additional sheet

As a result of the prior review under R. 40.2(e) PCT,
all additional fees are to be refunded.

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.:

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: 1-10

A punching press with a punch guide, spacer and the die holder consisting of a unitary or monolithic structure comprising the well-known features of pockets for nesting the mating surface of the die, stops, a catch and biasing means. The problem to be solved by invention 1.) can be regarded as to provide a simpler structure of a punching press.

2. claims: 11-13, 18, 19, 20

A punching press with an interface comprising a ball and a socket. The problem to be solved by invention 2.) can be regarded as to provide a special embodiment of an interface capable of mechanically coupling force from the press ram with the punch in a manner whereby the punch is mechanically decoupled from the press ram.

3. claims: 11,14-17

A punching press with a hydraulic system. The problem to be solved by invention 3.) can be regarded as to provide an apparatus that can limit the force exerted on the punch.

4. claims: 11,21-28

A punching device and a method for producing parts. The subplate having indexing features for aligning the stamping stations. The problem to be solved by invention 4.) can be regarded as to provide a punching press and a method for producing parts with higher precision due to a better alignment of the stamping stations.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/25939

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