

(19) World Intellectual Property Organization
International Bureau



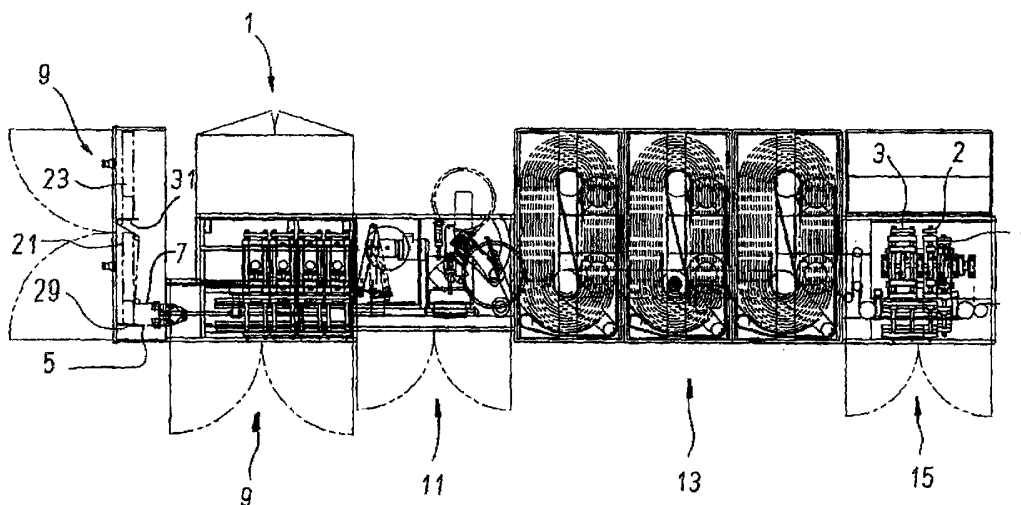
(43) International Publication Date
22 May 2003 (22.05.2003)

PCT

(10) International Publication Number
WO 03/041946 A3

- (51) International Patent Classification⁷: **B65B 59/04**, 9/04, B29C 51/38, 49/00
- (21) International Application Number: PCT/GB02/05164
- (22) International Filing Date:
15 November 2002 (15.11.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
MO2001A0000219
15 November 2001 (15.11.2001) IT
- (71) Applicant (for all designated States except US): **ELOPAK SYSTEMS AG** [CH/CH]; Postfach, Cherstrasse 4, CH-8152 Glattbrugg (CH).
- (71) Applicant (for GD only): **BURROWS, Anthony, Gregory** [GB/GB]; Business Centre West, Avenue One, Business Park, Letchworth Garden City, Hertfordshire SG6 2HB (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **FREDDI, Antonia** [IT/IT]; Via D. Pasquino Borghi, 20, I-42046 Reggio (IT). **BIANCHINI, Alessandro** [IT/IT]; Via dei Traeri, 54, I-41010 Cognento (IT).
- (74) Common Representative: **BURROWS, Anthony, Gregory**; Business Centre West, Avenue One, Business Park, Letchworth Garden City, Hertfordshire SG6 2HB (GB).
- (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, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), 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, IE, IT, LU, MC, NL, PT, SE, 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:
18 December 2003
- 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.

(54) Title: APPARATUS AND METHOD FOR DEFORMING OF SHEET MATERIAL



(57) Abstract: An apparatus for forming sheet material (5, 7) in order to obtain containers (3) comprises conveying means (129) arranged for advancing the sheet material, a welding unit (35a) arranged for welding the sheet material (57) along peripheral edges of the containers (3) to be formed, a forming unit (39a) arranged for forming the sheet material in order to obtain the containers (3), at least one of said units (35a, 39a) being mounted on guiding means (111) so that it is possible to adjust the longitudinal position of the at least one unit with respect to the other unit(s).

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 02/05164

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65B59/04 B65B9/04 B29C51/38 B29C49/00

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 B65B B29C

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 24 40 372 A (FINNAH JOSEF) 4 March 1976 (1976-03-04)	1,2,4
Y	page 2, paragraph 2; figures page 6, paragraph 3 - page 7, paragraph 1; claim 1; figures	3
Y	DE 12 44 642 B (HASSIA VERPACKUNGSMASCHINEN G) 13 July 1967 (1967-07-13)	3
A	column 2, lines 19-36 column 3, line 65 - column 4, line 11; figures	1,2
X	US 3 938 302 A (DONNET HENRY) 17 February 1976 (1976-02-17) column 3, line 52 - line 59	1,2
	-/--	

☒ 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)

"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

1 April 2003

Date of mailing of the international search report

30.09.2003

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

Kosicki, T.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 02/05164

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 802 804 A (ESPOSTI STEFANO DEGLI ET AL) 8 September 1998 (1998-09-08) abstract	6
Y	----- PATENT ABSTRACTS OF JAPAN vol. 1999, no. 05, 31 May 1999 (1999-05-31) & JP 11 042701 A (JAPAN STEEL WORKS LTD:THE), 16 February 1999 (1999-02-16) abstract	4-8
Y	----- US 5 639 415 A (TAKANASHI HIROAKI ET AL) 17 June 1997 (1997-06-17) column 12, line 52 - line 55; figures 17,18	4-8
Y	----- WO 98 13191 A (UNFILL INTERNATIONAL AG ;BARTOLI ANDREA (IT)) 2 April 1998 (1998-04-02) figures 1-4	4-8
A	----- US 4 702 688 A (SCHENK BERND) 27 October 1987 (1987-10-27) figures -----	4,5,7,8

INTERNATIONAL SEARCH REPORT

ational application No.
PCT/GB 02/05164

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

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.:
1-8.

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: 1-8

1.1. claims: 1-3

Apparatus comprising a plurality of operating units where the longitudinal distance between them can be adjusted

1.2. claims: 4-8

Apparatus comprising an operating unit having opening and closing means to clamp and release a sheet material

2. claims: 9-10

Apparatus comprising an operating unit which provides a mould portion connected with a support by means of a hinge

3. claims: 11-17

Apparatus comprising a movable supporting arrangement with which a grabbing arrangement is associated

4. claims: 18-26

Apparatus comprising a transporting chain for transporting sheet material

5. claims: 27-28 ,45-47

5.1 Apparatus comprising a shearing unit arranged for removing from said sheet material appendages

5.2 Apparatus comprising an actuating arrangement for actuating the deforming arrangements independently one from the other

6. claims: 29-42

Apparatus comprising an inducing arrangement for inducing separation indications

7. claims: 43-44

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Apparatus comprising a cutting arrangement serving to separate from the sheet material sections of the sheet material in order to constitute stacks comprising a pre-established number of the sections

8. claims: 48-50

Apparatus comprising a filler displaceable between an in-line position and an off-line position

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 02/05164

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 2440372	A	04-03-1976	DE 2440372 A1	04-03-1976
DE 1244642	B	13-07-1967	NONE	
US 3938302	A	17-02-1976	DE 2254738 A1	22-05-1974
			FR 2206232 A1	07-06-1974
			IT 996923 B	10-12-1975
			JP 49134487 A	24-12-1974
US 5802804	A	08-09-1998	IT B0940551 A1	17-06-1996
			DE 69510374 D1	22-07-1999
			DE 69510374 T2	24-02-2000
			EP 0797525 A1	01-10-1997
			JP 10510785 T	20-10-1998
			WO 9618539 A1	20-06-1996
JP 11042701	A	16-02-1999	NONE	
US 5639415	A	17-06-1997	JP 2595177 B2	26-03-1997
			JP 6226825 A	16-08-1994
			JP 2565633 B2	18-12-1996
			JP 6226824 A	16-08-1994
			DE 4402091 A1	04-08-1994
			KR 9709930 B1	19-06-1997
			US 5478229 A	26-12-1995
WO 9813191	A	02-04-1998	IT M0960121 A1	24-03-1998
			AU 4385297 A	17-04-1998
			DE 69710375 D1	21-03-2002
			DE 69710375 T2	10-10-2002
			WO 9813191 A1	02-04-1998
			EP 1024941 A1	09-08-2000
			JP 2001500809 T	23-01-2001
			US 6444160 B1	03-09-2002
US 4702688	A	27-10-1987	DE 3513388 A1	16-10-1986
			AT 48969 T	15-01-1990
			EP 0200937 A2	12-11-1986
			JP 1926367 C	25-04-1995
			JP 6057426 B	03-08-1994
			JP 61274918 A	05-12-1986