

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
13 November 2003 (13.11.2003)

PCT

(10) International Publication Number
WO 03/092972 A1

(51) International Patent Classification⁷: **B27N 1/00**,
3/00, C08L 97/02, B27N 3/20

SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number: PCT/IB03/02190

(22) International Filing Date: 1 May 2003 (01.05.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0210215.0 3 May 2002 (03.05.2002) GB

(71) Applicants (for all designated States except US): **K.C. SHEN INTERNATIONAL LIMITED** [BB/BB]; "Whitepark House", White Park Road, P.O. Box 806F, Bridgetown (BB). **KRONOSPAN TECHNICAL CO. LIMITED** [CY/CY]; 2 Andrea Zakkou Street, Office 201, 2404 Engomi, Nicosia (CY).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SHEN, Kuo, Cheng** [CA/CA]; 2118 Radford Court, Ottawa, Ontario K1J 8K1 (CA). **SHEN, Kenneth, C.** [CA/CA]; 2118 Radford court, Ottawa, Ontario K1J 8K1 (CA).

(74) Agent: **EVANS, Claire**; Edward Evans Barker, Clifford's Inn, Fetter Lane, London, EC4A 1BZ (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, SC, SD, SE,

(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, 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).

Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations 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, UZ, VC, VN, YU, ZA, ZM, ZW, 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, 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
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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: METHOD FOR MAKING DIMENSIONALLY STABLE COMPOSITE PRODUCTS FROM LIGNOCELLULOSIC MATERIAL

(57) Abstract: Process for making dimensionally stable reconstituted composite products from lignocellulosic material. By treating lignocellulose with high pressure steam to decompose and hydrolyse the hemicellulose, cellulose and lignin fractions of the lignocellulose and using those decomposition products as both a bonding and bulking agent, it converts, under heat and pressure in a moulding operation, the treated lignocellulose into moulded composite products such as panel boards and moulded articles. The composite products thus produced possess good physical and mechanical properties. Specifically, the dimensional stability in terms of the thickness swelling and linear expansion of panel boards such as fibreboards and particleboard can be minimized to very low levels when the panel boards are made in high density. The adhesive bond developed from thermosetting of the decomposition products of hemicellulose, cellulose and lignin is strong and stable, and resistant to boiling water and acid hydrolysis, and is free of formaldehyde emissions. Thus, the reconstituted panel boards and moulded products are suitable for exterior and particularly for indoor applications. The absence of free formaldehyde emissions makes the product very suitable for interior applications. The manufacturing cost for the reconstituted products is significantly lower in comparison to the conventional process because expensive synthetic resin is not used.



WO 03/092972 A1