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(21) International Application Number: PCT/US97/07727 (22) International Filing Date: 7 May 1997 (07.05.97) (30) Priority Data: 08/645,230 13 May 1996 (13.05.96) US (71) Applicants: MINNESOTA MINING AND MANUFACTURING COMPANY [US/US]; 3M Center, P.O. Box 33427, Saint Paul, MN 55133-3427 (US). ATLANTEK, INC. [US/US]; 10 High Street, Wakefield, RI 02879 (US). (72) Inventors: CORPUS, Paul, V.; P.O. Box 5123, Wakefield, RI 02879 (US). FIELD, Gary; 274 Dexter Street, Portsmouth, RI 02871 (US). FOSSUM, Douglas, K.; P.O. Box 33427, Saint Paul, MN 55133-3427 (US). (74) Agents: HOLMES, Stephen, J.; Salter & Michaelson, 321 South Main Street, Providence, RI 02903-7128 (US) et al.		(81) Designated States: AU, BR, CA, JP, KR, SG, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published With international search report.

(54) Title: APPARATUS FOR TWO-STAGE FUSION OF FACE-TO-FACE POLYMERIC SHEETS

(57) Abstract

Apparatus (117) operative for fusing an amorphous copolyester sheet (14) with a polyvinyl chloride sheet (16) includes a belt assembly (118) having an endless belt (122) received around first and second rollers (124, 126). The apparatus (117) further includes a third roller (158) mounted in cooperation with the first roller (124) to form an input nip with the first roller (124) such that the rollers (124, 158) press the sheets (14, 16) together to define a two-piece structure (12) having a polyvinyl chloride side and an opposing amorphous copolyester side. The polyvinyl chloride side is positioned adjacent to the first roller (124). The

apparatus (117) still further includes a cartridge heater (154) for heating the first roller (124) such that the polyvinyl chloride side of the two-piece structure (12) is heated as the sheets (14, 16) pass through the nip. The third roller (158) is cooled by a fan means (164) so that the amorphous copolyester side is cooled while the polyvinyl chloride side is heated. The apparatus (117) even further includes a heated platen (180) for applying additional heat to the polyvinyl chloride side of the two-piece structure (12). The heated platen (180) is in thermal communication with an underside of the belt (122) wherein further heat is applied to the polyvinyl chloride side of the two-piece structure as the belt (122) carries the two-piece structure over the platen (180). Finally, the apparatus includes fan cooled heat sinks (194, 202) positioned above and below the belt (122) for cooling both sides of the two-piece structure (12) as the two-piece structure is transported away from the heated platen (180).

