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(54) Title: SOLAR PANEL AND RAIL WITH EDGE CONNECTORS

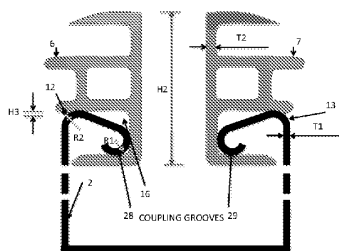


Fig. 24 represents a cross section of solar panel frames coupled with a rail according to this invention

(57) Abstract: Solar panels (1) in Figs. 1-3, including crystal solar panels and thin film solar panels, which at least at edges of two opposite sides (4, 5), have frames (6, 7), for use in fixed tilt solar system (Fig. 2) as well as use in tracking solar system (Fig. 3), are provided with coupling parts (8, 9, 16, 26) in Figs. 4A, 5A, 6, 8, 11, 13, 16-206, together with rails (2) in Figs. 6, 8, 11, 13-15, 20, 23, are also provided with coupling parts (10, 11, 15, 25), cooperating with each other, substantially in the form of tongue (15, 25) and groove (8, 16, 26), wherein the coupling parts are provided with integrated mechanical locking elements (12, 28, 37) which prevent the drifting or separating apart of coupled solar panel and rail in direction perpendicular to the solar panel surface and parallel to the solar panel surface. Furthermore the coupled tongue and groove are balanced by a set of forces in Fig. 8, Fig. 25, and integrated to support each other, and to support solar panel with combined mechanical strength, which provide opportunities to reduce materials usage, reduce dimensions, reduce packaging materials, reduce shipping cost, reduce installation time, as well as limiting installer error and other benefits.

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