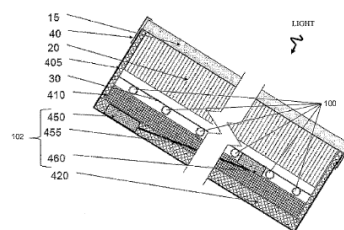


TIGI achieves IP foothold in transparently insulated solar thermal collectors

Honeycomb collectors – a new category

(12) United States Patent Klier et al.	(10) Patent No.: US 8,857,426 B2
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(54) SYSTEM AND METHOD FOR TEMPERATURE LIMITING IN A SEALED SOLAR ENERGY COLLECTOR	USPC 126/643; 126/704; 126/706; 126/639; 126/585; 126/572
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(73) Assignee: Tigi Ltd., Neve Yarak (IL)	(56) References Cited U.S. PATENT DOCUMENTS
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 76 days.	4,474,170 A 10/1984 McConnell 4,480,632 A 11/1984 Klier et al. 4,531,510 A 7/1985 Barthez et al. 4,586,489 A 5/1986 Vohl et al. 4,719,982 A 1/1988 Klier et al. 4,815,442 A 3/1989 Klier et al. 4,928,665 A 5/1990 Klier et al. 5,167,217 A 12/1992 Klier et al. 5,524,381 A 6/1996 Chabroudi 5,851,309 A 12/1998 Kousa 6,515,518 B1 2/2003 Gurett
(21) Appl. No.: 13/522,714	<i>Primary Examiner</i> —Alfred Basicinas
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(86) PCT No.: PCT/IB2011/050208 § 371 (c)(1), (2), (4) Date: Jul. 18, 2012	(57) ABSTRACT Insulated solar panels provide that provide a solar thermal collector with means for limiting stagnation temperatures and preventing damage include: temperature limiting is provided by the insulated solar panel, isolating internal components from the environment, using passive closed systems within the sealed solar thermal collector, while also allowing alternative implementations as active systems and/or portions of the temperature limiting system outside the sealed solar thermal collector. A heat pipe can be used as a passive thermal switch, where the temperature induced action at a predetermined temperature causes an abrupt transition from a state of thermal isolation to a state of strong thermal coupling. Additionally, a set of siphon circulation pipes provides a passive closed system for temperature limiting.
(87) PCT Pub. No.: WO2011/086534 PCT Pub. Date: Jul. 21, 2011	(58) Field of Classification Search USPC 126/643, 704, 639, 585, 572, 583, 589; 126/593, 595
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Related U.S. Application Data	
(60) Provisional application No. 61/295,789, filed on Jan. 18, 2010.	
(51) Int. Cl. <i>F24J 2/30</i> (2006.01) <i>F24J 2/46</i> (2006.01) U.S. Cl. CPC <i>F24J 2/4625</i> (2013.01); <i>Y02E 10/40</i> (2013.01)	
	41 Claims, 7 Drawing Sheets



The honeycomb collector is on its way to becoming a new category in solar thermal. Combining the thermal efficiency of evacuated collectors with the collection efficiency of flat plate collectors, honeycomb collectors open up new opportunities in the process heat and cold climate sectors of solar thermal heat. Pioneering work by TIGI’s founders on transparently insulated solar thermal collectors from the 1990s demonstrated the performance advantages in terms of efficiency at high temperature differentials between collector and environment. This work is now in the public domain.

However, since 2010, TIGI has invested heavily in R&D to overcome the key challenge in honeycomb collector productization – overheating. Recently, the US and Japanese patent offices have allowed broad claims protecting TIGI’s Overheat Protection Device in several different embodiments. Similar claims are pending in many other geographies including the Chinese and European patent offices. Furthermore, an additional invention disclosure, describing multiple applications of transparently insulated solar thermal collectors has been allowed in China and is also pending in multiple additional geographies. All in all, TIGI’s current portfolio comprises 7 patent families ranging from those mentioned above to our most recent application for an in-line heater integrated honeycomb storage collector, which received a clean search report from the EPO.