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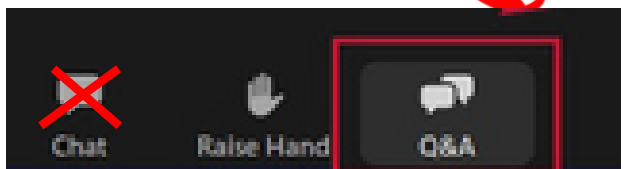

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IPC GREEN INVENTORY

The "IPC Green Inventory", developed by the IPC Committee of Experts, facilitates searches for patent information relating to Environmentally Sound Technologies (ESTs), as listed by the United Nations Framework Convention on Climate Change (UNFCCC).ESTs are currently scattered widely across the IPC in numerous technical fields. The Inventory attempts to collect them in one place.

For more information about how to use the IPC Green Inventory please click here.

The Inventory does not purport to be fully exhaustive in its coverage

TOPIC	IPC	PATENTSCOPE
▸ ALTERNATIVE ENERGY PRODUCTION		
▸ TRANSPORTATION		
▸ ENERGY CONSERVATION		
▸ WASTE MANAGEMENT		
▸ AGRICULTURE / FORESTRY		
▸ ADMINISTRATIVE, REGULATORY OR DESIGN ASPECTS		
▸ NUCLEAR POWER GENERATION		

▼ ALTERNATIVE ENERGY PRODUCTION		
▶ BIO-FUELS		
INTEGRATED GASIFICATION COMBINED CYCLE [IGCC]	C10L 3/00 F02C 3/28	C10L 3/00 F02C 3/28
▶ FUEL CELLS	H01M 4/86-4/98, 8/00-8/24, 12/00-12/08	H01M 4/86-4/98, 8/00-8/24, 12/00-12/08
PYROLYSIS OR GASIFICATION OF BIOMASS	C10B 53/00 C10J	C10B 53/00 C10J
▶ HARNESSING ENERGY FROM MANMADE WASTE		
▶ HYDRO ENERGY		
OCEAN THERMAL ENERGY CONVERSION [OTEC]	F03G	F03G 7/05
▶ WIND ENERGY	F03D	F03D
▶ SOLAR ENERGY	F24S H02S	F24S H02S
▶ GEOTHERMAL ENERGY	F24T	F24T
▶ OTHER PRODUCTION OR USE OF HEAT, NOT DERIVED FROM COMBUSTION, E.G. NATURAL HEAT	F24T 10/00-50/00 F24V 30/00-50/00	F24T 10/00-50/00 F24V 30/00-50/00
▶ USING WASTE HEAT		
DEVICES FOR PRODUCING MECHANICAL POWER FROM MUSCLE ENERGY	F03G 5/00-5/08	F03G 5/00-5/08
▶ TRANSPORTATION		
▶ ENERGY CONSERVATION		
▶ WASTE MANAGEMENT		

IPC

PATENTSCOPE

F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

LIGHTING; HEATING

F24 HEATING; RANGES; VENTILATING

Note(s)

In this class, the following terms are used with the meanings indicated:

- "stove" includes apparatus which may have an open fire, e.g. fireplace;
- "range" means an apparatus for cooking having elements that perform different cooking operations or cooking and heating operations.

D F24S **SOLAR HEAT COLLECTORS; SOLAR HEAT SYSTEMS** (for producing mechanical power from solar energy F03G 6/00) **[2018.01]**

Note(s) **[2018.01]**

In this subclass, the following terms or expressions are used with the meanings indicated:

- "solar heat collector modules", often referred to simply as "modules", covers:
  a. whole solar heat collectors;
  b. elements of solar heat collectors, e.g. reflectors, lenses or heat storage elements;
- "absorbing elements" covers elements for absorbing solar rays and converting it into heat;
- "solar heat systems" covers systems having solar heat collectors as their components and using the collected heat.

F24S 10/00 Solar heat collectors using working fluids [2018.01]

F24S 10/10 • the working fluids forming pools or ponds **[2018.01]**
F24S 10/13 • • Salt-gradient ponds **[2018.01]**
F24S 10/17 • • using covers or floating solar absorbing elements **[2018.01]**
F24S 10/20 • having circuits for two or more working fluids (with means for exchanging heat between two or more fluids F24S 10/30) **[2018.01]**
D F24S 10/25 • having two or more passages for the same working fluid layered in the direction of solar rays, e.g. having upper circulation channels connected with lower circulation channels **[2018.01]**
F24S 10/30 • with means for exchanging heat between two or more working fluids **[2018.01]**
F24S 10/40 • in absorbing elements surrounded by transparent enclosures, e.g. evacuated solar heat collectors **[2018.01]**
F24S 10/50 • the working fluids being conveyed between plates **[2018.01]**
F24S 10/55 • • with enlarged surfaces, e.g. with protrusions or corrugations (collectors comprising porous materials or permeable masses directly contacting the working fluids F24S 10/80) **[2018.01]**
F24S 10/60 • the working fluids trickling freely over absorbing elements **[2018.01]**
F24S 10/70 • the working fluids being conveyed through tubular absorbing conduits **[2018.01]**
F24S 10/75 • • with enlarged surfaces, e.g. with protrusions or corrugations (collectors comprising porous material or permeable masses directly contacting the working fluids F24S 10/80) **[2018.01]**
F24S 10/80 • comprising porous material or permeable masses directly contacting the working fluids (for conveying liquefied working fluid from evaporator sections to condenser sections with capillary force F24S 10/95) **[2018.01]**
F24S 10/90 • using internal thermosiphonic circulation **[2018.01]**
D F24S 10/95 • • having evaporator sections and condenser sections, e.g. heat pipes **[2018.01]**

F24S 20/00 Solar heat collectors specially adapted for particular uses or environments [2018.01]

	IPC	PATENTSCOPE
▼ ALTERNATIVE ENERGY PRODUCTION		
▶ BIO-FUELS		
INTEGRATED GASIFICATION COMBINED CYCLE [IGCC]	C10L 3/00 F02C 3/28	C10L 3/00 F02C 3/28
▶ FUEL CELLS	H01M 4/86-4/98, 8/00-8/24, 12/00-12/08	H01M 4/86-4/98, 8/00-8/24, 12/00-12/08
PYROLYSIS OR GASIFICATION OF BIOMASS	C10B 53/00 C10J	C10B 53/00 C10J
▶ HARNESSING ENERGY FROM MANMADE WASTE		
▶ HYDRO ENERGY		
OCEAN THERMAL ENERGY CONVERSION [OTEC]	F0	F03G 7/05
▶ WIND ENERGY	F03D	F03D
▶ SOLAR ENERGY	F24S H02S	F24S H02S
▶ GEOTHERMAL ENERGY	F24T	F24T
▶ OTHER PRODUCTION OR USE OF HEAT, NOT DERIVED FROM COMBUSTION, E.G. NATURAL HEAT	F24T 10/00-50/00 F24V 30/00-50/00	F24T 10/00-50/00 F24V 30/00-50/00
▶ USING WASTE HEAT		
DEVICES FOR PRODUCING MECHANICAL POWER FROM MUSCLE ENERGY	F03G 5/00-5/08	F03G 5/00-5/08
▶ TRANSPORTATION		
▶ ENERGY CONSERVATION		
▶ WASTE MANAGEMENT		

IC:"F24S"

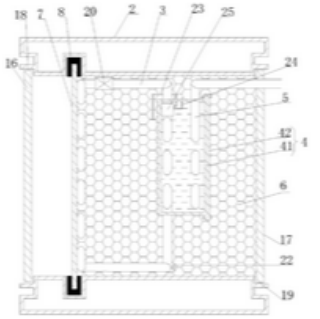
41,410 results | Offices all | Languages all | Stemming true | Single Family Member false | Include NPL false

Sort: Relevance | Per page: 100 | View: All+Image | 1 / 415 | Download | Machine translation

1. **211316601** PLATE-TUBE TYPE PHASE-CHANGE SOLAR WATER HEATER — CN - 21.08.2020

Int.Class F24S 10/70 **Appl.No** 201922009415.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

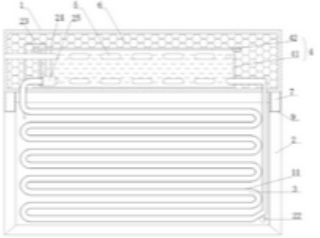
The utility model discloses a plate tube type phase change solar water heater which comprises a heat absorption plate frame, a heat absorption plate is arranged on the heat absorption plate frame, anda heat conduction pipeline is arranged on the back face of the heat absorption plate. The heat absorption plate frame is further provided with a back plate, the heat absorption plate frame, the heatabsorption plate and the back plate form a closed space, an inner material box is arranged in the space, and the interior of the inner material box is filled with heat preservation materials. The heatconduction pipeline is a circulating pipe and penetrates through the inner material box; an inlet and an outlet of the water supply pipeline are formed in the heat absorption plate frame, the middlesection penetrates through the inner material box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner material box absorbs solar heat in the daytime andstores the heat, when hot water needs to be used, cold water is heated through the inner material box, the hot water is discharged, the solar water heater is suitable for rainy days after high temperature, after the inner material box is heated, the influence of the environment with low external rainy day temperature on the inner material box is small, heat loss is slow, and a water supply pipeline can still be heated in cloudy and rainy days.



2. **111043773** TUBULAR PHASE CHANGE SOLAR WATER HEATER — CN - 21.04.2020

Int.Class F24S 10/70 **Appl.No** 201911135675.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

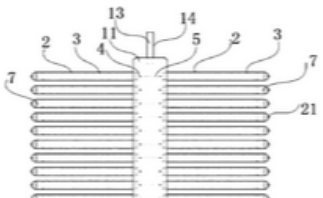
The invention discloses a tubular phase change solar water heater. The tubular phase change solar water heater comprises a storage box shell. The lower portion of the storage box shell is connected with a heat absorption plate frame, a glass heat absorption pipe is erected in the heat absorption plate frame through a support, and a heat conduction pipeline is arranged in the glass heat absorptionpipe. An inner box is placed in the storage box shell, and the clearance between the inner box and the storage box shell is filled with an insulating material. The heat conduction pipe is a circulating pipe and penetrates the inner box in the storage box shell. A water supply pipeline is further included. An outlet and an inlet of the water supply pipeline are all arranged on the storage box shell, the middle segment of the water supply pipeline penetrates through the inner box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner box absorbs solarheat in the daytime and stores the heat, when hot water is needed, cold water is warmed through the inner box, hot water is output, and the solar water heater is suitable for rainy days after high temperature; and after the inner box is warmed, the influenced of the environment where the temperature is low in rainy days is small, heat losses are slow, and the water supply pipeline can still be heated in overcast and rainy weather.



3. **207527861** MODIFIED EVACUATED COLLECTOR TUBE — CN - 22.06.2018

Int.Class F24S 10/40 **Appl.No** 201720987344.5 **Applicant** YUNNAN HUIBIAO NEW ENERGY TECHNOLOGY CO., LTD. **Inventor** HUANGFU JIANGUAN

The utility model discloses a modified evacuated collector tube, the mutual disposition is allying oneself with taking the vacuum tube of cavity and setting up that seal the inner in the vacuum tube cavity, outer end open -ended heat conduction branch pipe of soot collector both sides including about the array, and it is still including being equipped with the connecting elements, and the outer end opening part of each vacuum tube and heat conduction branch pipe is transversely located to the connecting elements, and each group interconnects as an organic wholely through a pair of connecting elements and the connecting elements of both sides of drawing between the relative vacuum tube each other mutually. The utility model discloses because the auxiliary connection has drawing the connecting elements between relative vacuum tube, can ensure it conduct heat to connect reliability and manages to drop easily with preventing vacuum and cause the unreliable problem of work, can make it exist at the metal heat pipe still can keep at utmost contact heat transfer with the glass evacuated collector tube inner wall under the influence of installation form and position error, from the structural whole efficiency of solar vacuum tubular collector



IC:"F24S"

41,[illegible]0 results | Offices all | Languages en | Stemming true | Single Family Member false | Include NPL false

Sort: Relevance | Per page: 10 | View: All | 1 / 4,141 | Machine translation

1. **211316601** PLATE-TUBE TYPE PHASE-CHANGE SOLAR WATER HEATER — CN - 21.08.2020

Int.Class F24S 10/70 **Appl.No** 201922009415.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

The utility model discloses a plate tube type phase change solar water heater which comprises a heat absorption plate frame, a heat absorption plate is arranged on the heat absorption plate frame, anda heat conduction pipeline is arranged on the back face of the heat absorption plate. The heat absorption plate frame is further provided with a back plate, the heat absorption plate frame, the heatabsorption plate and the back plate form a closed space, an inner material box is arranged in the space, and the interior of the inner material box is filled with heat preservation materials. The heatconduction pipeline is a circulating pipe and penetrates through the inner material box; an inlet and an outlet of the water supply pipeline are formed in the heat absorption plate frame, the middlesection penetrates through the inner material box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner material box absorbs solar heat in the daytime andstores the heat, when hot water needs to be used, cold water is heated through the inner material box, the hot water is discharged, the solar water heater is suitable for rainy days after high temperature, after the inner material box is heated, the influence of the environment with low external rainy day temperature on the inner material box is small, heat loss is slow, and a water supply pipeline can still be heated in cloudy and rainy days.

2. **111043773** TUBULAR PHASE CHANGE SOLAR WATER HEATER — CN - 21.04.2020

Int.Class F24S 10/70 **Appl.No** 201911135675.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

The invention discloses a tubular phase change solar water heater. The tubular phase change solar water heater comprises a storage box shell. The lower portion of the storage box shell is connected with a heat absorption plate frame, a glass heat absorption pipe is erected in the heat absorption plate frame through a support, and a heat conduction pipeline is arranged in the glass heat absorptionpipe. An inner box is placed in the storage box shell, and the clearance between the inner box and the storage box shell is filled with an insulating material. The heat conduction pipe is a circulating pipe and penetrates the inner box in the storage box shell. A water supply pipeline is further included. An outlet and an inlet of the water supply pipeline are all arranged on the storage box shell, the middle segment of the water supply pipeline penetrates through the inner box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner box absorbs solarheat in the daytime and stores the heat, when hot water is needed, cold water is warmed through the inner box, hot water is output, and the solar water heater is suitable for rainy days after high temperature; and after the inner box is warmed, the influenced of the environment where the temperature is low in rainy days is small, heat losses are slow, and the water supply pipeline can still be heated in overcast and rainy weather.

3. **207527861** MODIFIED EVACUATED COLLECTOR TUBE — CN - 22.06.2018

Int.Class F24S 10/40 **Appl.No** 201720987344.5 **Applicant** YUNNAN HUIBIAO NEW ENERGY TECHNOLOGY CO., LTD. **Inventor** HUANGFU JIANGUAN

The utility model discloses a modified evacuated collector tube, the mutual disposition is allying oneself with taking the vacuum tube of cavity and setting up that seal the inner in the vacuum tube cavity, outer end open -ended heat conduction branch pipe of soot collector both sides including about the array, and it is still including being equipped with the connecting elements, and the outer end opening part of each vacuum tube and heat conduction branch pipe is transversely located to the connecting elements, and each group interconnects as an organic wholely through a pair of connecting elements and the connecting elements of both sides of drawing between the relative vacuum tube each other mutually. The utility model discloses because the auxiliary connection has drawing the connecting elements between relative vacuum tube, can ensure it conduct heat to connect reliability and manages to drop easily with preventing vacuum and cause the unreliable problem of work, can make it exist at the metal heat pipe still can keep at utmost contact heat transfer with the glass evacuated collector tube inner wall under the influence of installation form and position error, from the structural whole efficiency of solar vacuum tubular collector spare and the biography thermal reliability under the high low temperature condition of having improved, absorb improvement heat absorption efficiency under the equal thermal prerequisite of production.

41,410 results Offices all Languages en Stemming true Single Family Member false Include NPL false

ANALYSIS

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Countries		Applicants		Inventors		IPC code		Publication Dates	
China	27,767	COMMISSARIAT ENERGIE ATOMIQUE	120	THE INVENTOR HAS WAIVED THE RIGHT TO BE MENTIONED	346	F24S	41,409	2013	507
European Patent Office	2,932	HEBEI DAORONG NEW ENERGY TECH CO LTD	90	XUE DAORONG	105	H02S	15,429	2014	470
France	1,856	NEXTRACKER INC	83	WANG JUN	98	F24J	3,402	2015	503
PCT	1,591	PHILIPS NV	77	WANG WEI	87	F24D	2,473	2016	791
United States of America	1,474	STATE GRID CO OF CHINA	74	LIU YANG	83	H01L	1,464	2017	995
Australia	970	SUNPOWER CO	72	LI WEI	82	H02J	1,330	2018	7,084
United Kingdom	712	TIANJIN UNIVERSITY	72	PAN XIANGSI	81	E04D	1,286	2019	6,759
Italy	544	ABENGOA SOLAR NEW TECH SA	68	ZHANG LEI	76	G02B	1,275	2020	8,439
Spain	331	QINGDAO ECONOMIC AND TECH DEVELOPMENT ZONE HAIER WATER HEATER CO LTD	68	LI JUN	75	F28D	1,193	2021	9,082
Republic of Korea	324	SOUTHEAST UNIVERSITY	68	WANG KAI	63	F25B	1,173	2022	37

IC:"F24S"

41,410 results | Offices all | Languages en | Stemming true | Single Family Member false | Include NPL false

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PCT	1,591	PHILIPS NV	77	WANG WEI	87	F24D	2,473	2016	791
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Italy	544	ABENGOA SOLAR NEW TECH SA	68	ZHANG LEI	76	G02B	1,275	2020	8,439
Spain	331	QINGDAO ECONOMIC AND TECH DEVELOPMENT ZONE HAIER WATER HEATER CO LTD	68	LI JUN	75	F28D	1,193	2021	9,082
Republic of Korea	324	SOUTHEAST UNIVERSITY	68	WANG KAI	63	F25B	1,173	2022	37

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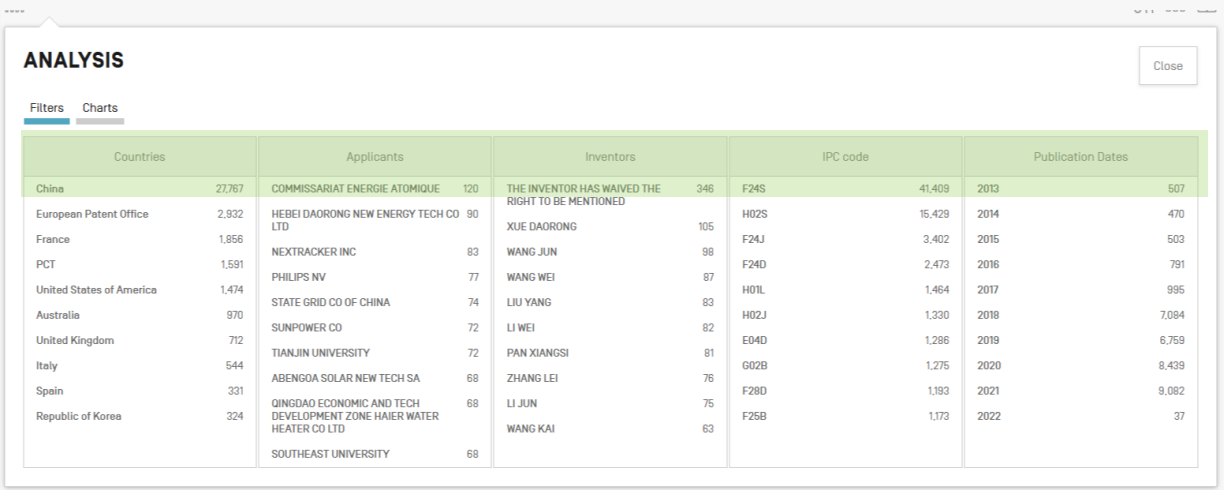
China	27,767	COMMISSARIAT ENERGIE ATOMIQUE	120	THE INVENTOR HAS WAIVED THE RIGHT TO BE MENTIONED	346	F24S	41,409	2013	507
European Patent Office	2,932	HEBEI DAORONG NEW ENERGY TECH CO LTD	90	XUE DAORONG	105	H02S	15,429	2014	470
France	1,856	NEXTRACKER INC	83	WANG JUN	98	F24J	3,402	2015	503
PCT	1,591	PHILIPS NV	77	WANG WEI	87	F24D	2,473	2016	791
United States of America	1,474	STATE GRID CO OF CHINA	74	LIU YANG	83	H01L	1,464	2017	995
Australia	970	SUNPOWER CO	72	LI WEI	82	H02J	1,330	2018	7,084
United Kingdom	712	TIANJIN UNIVERSITY	72	PAN XIANGSI	81	E04D	1,286	2019	6,759
Italy	544	ABENGOA SOLAR NEW TECH SA	68	ZHANG LEI	76	G02B	1,275	2020	8,439
Spain	331	QINGDAO ECONOMIC AND TECH DEVELOPMENT ZONE HAIER WATER HEATER CO LTD	68	LI JUN	75	F28D	1,193	2021	9,082
Republic of Korea	324	SOUTHEAST UNIVERSITY	68	WANG KAI	63	F25B	1,173	2022	37



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- [ ] Kind code

ANALYSIS

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Countries		Offices		Applicants		IPC code		CPC code		Publication Dates		Kind code	
China	27,767	China	27,975	COMMISSARIAT ENERGIE ATOMIQUE	120	F24S	41,409	y02e 10/47	15,854	2008	214	U	17,404
European Patent Office	2,932	European Patent Office	3,070	HEBEI DAORONG NEW ENERGY TECH CO LTD	90	H02S	15,429	y02e 10/50	13,329	2009	337	A	11,293
France	1,856	France	1,856	NEXTRACKER INC	83	F24J	3,402	y02e 10/44	10,465	2010	391	B	3,314
PCT	1,591	United States of America	1,815	PHILIPS NV	77	F24D	2,473	y02e 10/40	9,972	2011	483	B1	2,645
United States of America	1,474	PCT	1,591	STATE GRID CO OF CHINA	74	H01L	1,464	y02b 10/20	5,766	2012	490	A1	2,614
Australia	970	Australia	975	SUNPOWER CO	72	H02J	1,330	y02b 10/10	2,810	2013	507	B2	1,305
United Kingdom	712	United Kingdom	716	TIANJIN UNIVERSITY	72	E04D	1,286	h02s 20/30	2,051	2014	470	A4	567
Italy	544	Italy	544	ABENGOA SOLAR NEW TECH SA	68	G02B	1,275	f24s 30/425	1,842	2015	503	U1	370
Spain	331	Canada	374	QINGDAO ECONOMIC AND TECH DEVELOPMENT ZONE HAIER WATER HEATER CO LTD	68	F28D	1,193	h02s 20/32	1,736	2016	791	T3	336
Republic of Korea	324	Republic of Korea	372	SOUTHEAST UNIVERSITY	68	F25B	1,173	f24s 20/20	1,566	2017	995	A3	309
Canada	312	Spain	344	INNER MONGOLIA UNIVERSITY OF TECH	67	F24H	1,114	y02e 10/52	1,507	2018	7,084	A2	260
Czech Republic	298	Germany	323	OWENS ILLINOIS INC	66	F03G	1,088	y02e	1,490	2019	6,759	B3	136
Germany	284	Czech Republic	300	ZHEJIANG CHINT NEW ENERGY DEVELOPMENT CO LTD	64	F24F	979	f24s	1,461	2020	8,439	C2	112
Greece	238	Japan	289	JIANGSU SUNNIC SOLAR ENERGY INDUSTRY CO LTD	63	E04B	875	f24s 50/20	1,347	2021	9,082	B6	98
Sweden	225	Greece	238	ZHEJIANG SUPCON SOLAR ENERGY TECH CO LTD	61	F21S	874	y02e 10/60	1,244	2022	37	L	95

Coverage

https://patentscope.wipo.int/search/en/help/data_coverage.jsf

Updated: November 16, 2021

Country	Latest Biblio	Update Frequency	Biblio Data	Abstract	Chemical Data	Chemical indexed	Doc images	OCR (full-text) Indexed	Nb records
PCT	16.11.2021	Daily	19.10.1978 - 11.11.2021	19.10.1978 - 11.11.2021	11.01.1979 - 04.11.2021	874,511	4,181,243	**Total: 4,177,263** English: 2,370,635 French: 138,875 Spanish: 28,419 German: 412,661 Korean: 134,152 Japanese: 698,937 Chinese: 366,635 Russian: 21,435 Portuguese: 5,514	4,181,243
African Regional Intellectual Property Organization (ARIPO)			03.07.1985 - 28.07.2008	03.07.1985 - 28.07.2008			1,676	**Total: 1,671** English: 1,671	1,868
Argentina	20.10.2021	Monthly	11.02.1965 - 29.09.2021	31.10.1990 - 29.09.2021			9,741	**Total: 8,906** Spanish: 8,906	168,807
Australia	03.11.2021	Weekly	14.01.1900 -	08.01.1981 -				**Total: 686,179**	1,795,579

ANALYSIS

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Countries		Offices		Applicants		IPC code		CPC code		Publication Dates		Kind code	
China	27,767	China	27,975	COMMISSARIAT ENERGIE ATOMIQUE	120	F24S	41,409	y02e 10/47	15,854	2008	214	U	17,404
European Patent Office	2,932	European Patent Office	3,070	HEBEI DAORONG NEW ENERGY TECH CO LTD	90	H02S	15,429	y02e 10/50	13,329	2009	337	A	11,293
France	1,856	France	1,856	NEXTRACKER INC	83	F24J	3,402	y02e 10/44	10,465	2010	391	B	3,314
PCT	1,591	United States of America	1,815	PHILIPS NV	77	F24D	2,473	y02e 10/40	9,972	2011	483	B1	2,645
United States of America	1,474	PCT	1,591	STATE GRID CO OF CHINA	74	H01L	1,464	y02b 10/20	5,766	2012	490	A1	2,614
Australia	970	Australia	975	SUNPOWER CO	72	H02J	1,330	y02b 10/10	2,810	2013	507	B2	1,305
United Kingdom	712	United Kingdom	716	TIANJIN UNIVERSITY	72	E04D	1,286	h02s 20/30	2,051	2014	470	A4	567
Italy	544	Italy	544	ABENGOA SOLAR NEW TECH SA	68	G02B	1,275	f24s 30/425	1,842	2015	503	U1	370
Spain	331	Canada	374	QINGDAO ECONOMIC AND TECH DEVELOPMENT ZONE HAIER WATER HEATER CO LTD	68	F28D	1,193	h02s 20/32	1,736	2016	791	T3	336
Republic of Korea	324	Republic of Korea	372	SOUTHEAST UNIVERSITY	68	F25B	1,173	f24s 20/20	1,566	2017	995	A3	309
Canada	312	Spain	344	INNER MONGOLIA UNIVERSITY OF TECH	67	F24H	1,114	y02e 10/52	1,507	2018	7,084	A2	260
Czech Republic	298	Germany	323	OWENS ILLINOIS INC	66	F03G	1,088	y02e	1,490	2019	6,759	B3	136
Germany	284	Czech Republic	300	ZHEJIANG CHINT NEW ENERGY DEVELOPMENT CO LTD	64	F24F	979	f24s	1,461	2020	8,439	C2	112
Greece	238	Japan	289	JIANGSU SUNNIC SOLAR ENERGY INDUSTRY CO LTD	63	E04B	875	f24s 50/20	1,347	2021	9,082	B6	98
Sweden	225	Greece	238	ZHEJIANG SUPCON SOLAR ENERGY TECH CO LTD	61	F21S	874	y02e 10/60	1,244	2022	37	L	95

IC:"F24S"

41,410 results Offices all Languages all Stemming true Single Family Member false Include NPL false

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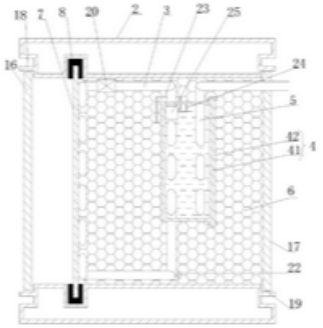
1. **211316601** PLATE-TUBE TYPE PHASE-CHANGE SOLAR WATER HEATER

CN - 21.08.2020

Int.Class F24S 10/70 Appl.No 201922009415.6 Applicant ZHANG CHUANDONG Inventor ZHANG CHUANDONG

The utility model discloses a plate tube type phase change solar water heater which comprises a heat absorption plate frame, a heat absorption plate is arranged on the heat absorption plate frame, anda heat conduction pipeline is arranged on the back face of the heat absorption plate. The heat absorption plate frame is further provided with a back plate, the heat absorption plate frame, the heatabsorption plate and the back plate form a closed space, an inner material box is arranged in the space, and the interior of the inner material box is filled with heat preservation materials. The heatconduction pipeline is a circulating pipe and penetrates through the inner material box; an inlet and an outlet of the water supply pipeline are formed in the heat absorption plate frame, the middlesection penetrates through the inner material box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner material box absorbs solar heat in the daytime andstores the heat, when hot water needs to be used, cold water is heated through the inner material box, the hot water is discharged, the solar water heater is suitable for rainy days after high temperature, after the inner material box is heated, the influence of the environment with low external rainy day temperature on the inner material box is small, heat loss is slow, and a water supply pipeline can still be heated in cloudy and rainy days.

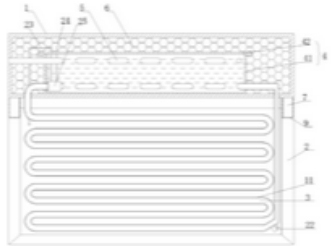


2. **111043773** TUBULAR PHASE CHANGE SOLAR WATER HEATER

CN - 21.04.2020

Int.Class F24S 10/70 Appl.No 201911135675.6 Applicant ZHANG CHUANDONG Inventor ZHANG CHUANDONG

The invention discloses a tubular phase change solar water heater. The tubular phase change solar water heater comprises a storage box shell. The lower portion of the storage box shell is connected with a heat absorption plate frame, a glass heat absorption pipe is erected in the heat absorption plate frame through a support, and a heat conduction pipeline is arranged in the glass heat absorptionpipe. An inner box is placed in the storage box shell, and the clearance between the inner box and the storage box shell is filled with an insulating material. The heat conduction pipe is a circulating pipe and penetrates the inner box in the storage box shell. A water supply pipeline is further included. An outlet and an inlet of the water supply pipeline are all arranged on the storage box shell, the middle segment of the water supply pipeline penetrates through the inner box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner box absorbs solarheat in the daytime and stores the heat, when hot water is needed, cold water is warmed through the inner box, hot water is output, and the solar water heater is suitable for rainy days after high temperature; and after the inner box is warmed, the influenced of the environment where the temperature is low in rainy days is small, heat losses are slow, and the water supply pipeline can still be heated in overcast and rainy weather.



3. **207527861** MODIFIED EVACUATED COLLECTOR TUBE

CN - 22.06.2018

Int.Class F24S 10/40 Appl.No 201720987244.5 Applicant YUNNAN HUIRIAO NEW ENERGY TECHNOLOGY CO., LTD. Inventor HUANGFU JIANGJIAN

IC:"F24S" AND EN_CL:collector

1,687 results Offices all Languages all Stemming true Single Family Member false Include NPL false

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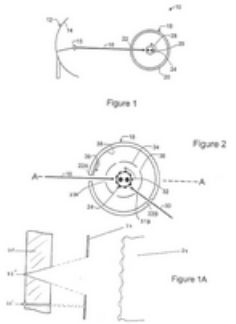
1. **2580537** APPARATUS FOR SOLAR ENERGY COLLECTION AND CONVERSION

EP - 17.04.2013

Int.Class F24S 40/52 **Appl.No** 11791754 **Applicant** PENWORTH PTY LTD **Inventor** WORTHINGTON RICHARD JOHN

The present invention relates to a solar energy collector [18] including an outer casing [20] having at least one aperture [22] disposed therein and an absorber [24] disposed within the outer casing [20]. The aperture [22] is arranged to receive a beam [16] of solar radiation therethrough so that the beam [16] is incident on the absorber [24]. The absorber [24] is arranged in use to absorb the energy of the beam of solar radiation and to thereby convert solar radiation to heat energy to heat a fluid communicated through the absorber [24]. The absorber [24] is arranged to be moved by a moving means to promote even heating of the absorber [24].



2. **WO/2020/254822** SOLAR THERMAL COLLECTOR

WO - 24.12.2020

Int.Class F24S 10/25 **Appl.No** PCT/GB2020/051490 **Applicant** HERIOT-WATT UNIVERSITY **Inventor** GHANI, Faisal

A solar thermal collector adapted to be assembled from a flat pack configuration, comprising a conduit [6] configured to carry fluid and to absorb radiation, a base [1] above which the conduit [6] is mounted and a plurality of panels configured to interconnect with the base [1] to produce a housing [8] for the conduit [6].

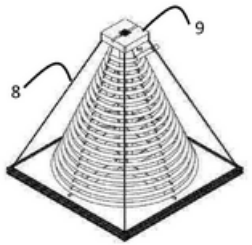


Figure 4

Incorrect value "F24S" -example A61F1/00

IC:"F24S" AND EN_CL:collector AND DP:[2018 TO 2022]

IC:"F24S" AND DP:[2018 to 2022] AND PA:(sunpower or southeast university)

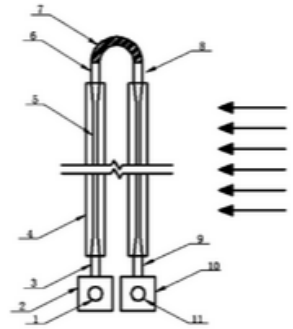
2,713 results Offices all Languages all Stemming true Single Family Member false Include NPL false

Sort: Relevance Per page: 100 View: All+Image 1 / 28 Download Machine translation

1. **108413617** HIGH-TEMPERATURE VACUUM TUBE BUNDLE HEAT ABSORBER FOR SMALL TOWER SYSTEM

CN - 17.08.2018

Int.Class F24S 10/40 Appl.No 201810145273.3 Applicant SOUTHEAST UNIVERSITY Inventor KUANG RAO

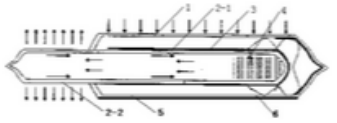


The invention discloses a high-temperature vacuum tube bundle heat absorber for a small tower system. The high-temperature vacuum tube bundle heat absorber comprises multiple vacuum heat absorption tubes of which the middle cross sections are in an oval or circular shape, the tube row number is two, and the tubes are distributed in the shape of a regular triangle; each vacuum heat absorption tubecomprises an internal metal flat tube or round tube and an external glass tube which are connected through an expansion joint; on the upper portion of a tube bundle, a front-row inlet metal tube is connected with a back-row outlet metal tube through a top corrugated tube; on the lower portion of the tube bundle, a back-row inlet metal tube is connected with a flow divider, and a front-row outlet metal tube is connected with a flow collector; and the bared internal tubes and the corrugated tubes are covered with a heat insulating material, and the heat absorber is fixed to a heat absorption tower through the portions, near inlets and outlets, of the internal tubes. According to the high-temperature vacuum tube bundle heat absorber for the small tower system, the light absorption and reflection capability is high, heat loss is low, and light energy converged by heliostats from different areas can be received at different times.

2. **111306811** ALL-GLASS HEAT PIPE TYPE VACUUM HEAT COLLECTING PIPE WITH CPC CONDENSER

CN - 19.06.2020

Int.Class F24S 10/40 Appl.No 202010120635.0 Applicant SOUTHEAST UNIVERSITY Inventor WANG JUN

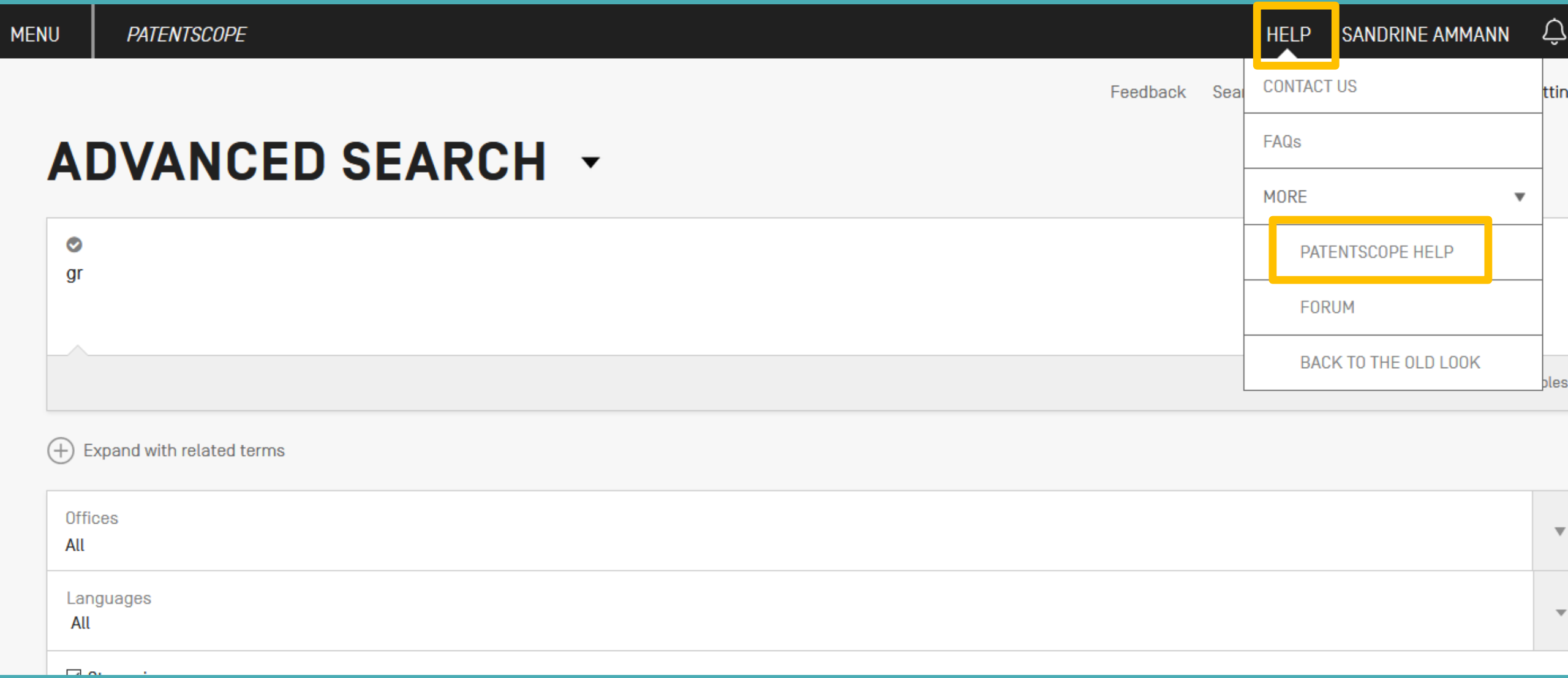


The invention discloses an all-glass heat pipe type vacuum heat collecting pipe with a CPC condenser. A glass outer pipe and a glass heat pipe are included, wherein the glass heat pipe stretches intothe glass outer pipe and is in seamless and fixed connection with the opening position of the glass outer pipe. The vacuum degree in a cavity between the glass outer pipe and the glass heat pipe is smaller than 1x10-4Pa, meanwhile, a supporting structure and a getter are placed in the cavity, heat transfer working media are arranged in the glass heat pipe, the part, located in the glass outer pipe, of the glass heat pipe becomes a heating section, the part located outside the glass outer pipe is inserted in a hot water tank and becomes a condensation section, the outer wall face of the heatingsection is coated with a heat absorbing coating, the same glass is adopted in the glass outer pipe and the glass heat pipe, and the CPC condenser is arranged between the glass outer pipe and the glass heat pipe. The all-glass heat pipe type vacuum heat collecting pipe is adopted, the problem about air seal connection of a metal-glass vacuum heat collector is solved, meanwhile, the CPC condenser is inserted in the vacuum area between the heat pipe and the outer pipe, and the heat efficiency is improved.

3. **108679855** LARGE-CALIBER PHASE-CHANGE ENERGY STORAGE TYPE SOLAR AIR HEAT COLLECTION PIPE

CN - 19.10.2018

Int.Class F24S 10/40 Appl.No 201810398466.X Applicant SOUTHEAST UNIVERSITY Inventor CHEN ZHENQIAN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- New in PATENTSCOPE: Chemical Sub-Structure Search [Sep 19, 2019]
- The New PATENTSCOPE Interface [Sep 18, 2019]
- Webinar On Upcoming New PATENTSCOPE Interface [Sep 9, 2019]

Symbol	Name	elp	Type	Stemmed	Parent
ALLTXT	Text	The entered value is searched against the english Title, Abstract, Claims and Description Fields; the stemming option is off. ALLTXT:("electric car" OR "voiture electrique"~50)	text		[ALL]
EN_ALLTXT	English Text	The entered value is searched against the english Title, Abstract, Claims and Description Fields; the stemming option is on. EN_ALLTXT:("electric car"~50) EN_ALLTXT:("sol* panel"~5) EN_ALLTXT:(elect?icit?) EN_ALLTXT:(electric^10 and car^3)	text	X	[EN_ALL]
FR_ALLTXT	French Text	FR_ALLTXT:("voiture électrique"~50)	text	X	[FR_ALL]
DE_ALLTXT	German Text	DE_ALLTXT:("elektro auto")	text	X	[DE_ALL]
ES_ALLTXT	Spanish Text	ES_ALLTXT:("coche eléctrico")	text	X	[ES_ALL]
VN_ALLTXT	Vietnamese Text	VN_ALLTXT:("xe hơi điện"~10)	text	X	[VN_ALL]
RU_ALLTXT	Russian Text	RU_ALLTXT:("электрический автомобиль")	text	X	[RU_ALL]
JA_ALLTXT	Japanese Text	フルテキスト：「発明の名称」、「要約」、「請求の範	text	X	[JA_ALL]

CROSS LINGUAL EXPANSION

Search terms... *
collector

Query Language"
English

The language of your query

Expansion Mode:
(•) Automatic
( ) Supervised

Use the **Supervised** mode to select the technical domains, the relevant variants, the languages to translate your query to and the fields to search by

Precision level
High

Influences the precision of the suggested variants.
Highest level considers only the most relevant ones (less suggested variants)
Lowest level considers the less relevant as well (more suggested variants)

Search

EN_AB:("collector" OR "sensor") OR FR_AB:("collecteur" OR "capteur" OR "détecteur") OR DE_AB:("Sensor" OR "Kollektor" OR "Sammler" OR "Abscheider" OR "Elektroabscheider" OR "Sonnenkollektor

4,304,934 results Offices all Languages all Stemming true Single Family Member false Include NPL false

FULL QUERY

Close Edit

EN_AB:("collector" OR "sensor") OR FR_AB:("collecteur" OR "capteur" OR "détecteur") OR DE_AB:("Sensor" OR "Kollektor" OR "Sammler" OR "Abscheider" OR "Elektroabscheider" OR "Sonnenkollektor" OR "Aufbauelementen") OR ES_AB:("colector" OR "recolector" OR "sensor" OR "captador" OR "recogida") OR PT_AB:("coletor" OR "colector" OR "sensor" OR "captor" OR "operar") OR JA_AB:("センサ" OR "集熱器" OR "コレクタ" OR "コレクター" OR "集電" OR "収集器" OR "集光器" OR "捕集器" OR "回収器") OR RU_AB:("собиратель" OR "коллектор" OR "датчик" OR "сборного" OR "накопитель" OR "коллекторного" OR "сенсорное" OR "сенсор") OR ZH_AB:("传感器" OR "集热器" OR "捕收剂" OR "尘器" OR "集器" OR "收集") OR KO_AB:("센서" OR "집열기" OR "수집기의" OR "집열장치" OR "회수기" OR "콜렉터" OR "집열판" OR "집진 장치" OR "수거장치") OR IT_AB:("collettore" OR "sensore" OR "polveri") OR SV_AB:("detektor" OR "samlarreagenskomposition" OR "kollektorn" OR "däri" OR "mne" OR "sensor" OR "kollektor" OR "givare" OR "samlare") OR NL_AB:("collector" OR "sensor" OR "verzamelen" OR "sondes" OR "opnemen" OR "verzamelaar" OR "collectororgaan" OR "energiecollector") OR PL_AB:("kolektor" OR "słoneczny" OR "jonowego" OR "otrzymywania kolektora" OR "czujkami" OR "czujnik" OR "odczynnik flotocyjny") OR DA_AB:("kollektor" OR "føler" OR "opsamler" OR "sensor" OR "opfanger" OR "solarkollektor" OR "foeler")

Sort: Relevance **Per page:** 100 **View:** All+Image 1 / 43,050 Download Machine translation

1. **WO/2011/006488** SOLAR COLLECTOR WO - 20.01.2011

Int.Class C09K 5/04 **Appl.No** PCT/DE2010/000849 **Applicant** BORONTEC AG **Inventor** ADEM, Sari

The invention relates to a solar collector that transmits heat energy particularly efficiently by means of the heat-conducting fluid "Heatboron". At least one double-walled collector pipe is built into a metal or plastic housing consisting of radiation-permeable glass. Water to be heated flows through the inner pipe. The inner chamber of the outer pipe is provided with a pressure-proof feed valve via which the "Heatboron" can be introduced. The inner pipe and the outer pipe consist of metal, plastic or glass. In systems comprising a plurality of collector pipes, the water to be heated is supplied to the collector pipes by means of a distributor. The heated water is collected in a collector and transported to the consumer. Distributors and collectors are arranged in the collector housing. The double-walled collector pipes are mounted between the distributor and the collector.

ADVANCED SEARCH

Incorrect value "F24S" -example A61F1/00

IC:"F24S" AND EN_AB:("collector" OR "sensor") OR JA_AB:("センサ" OR "集熱器" OR "コレクタ" OR "コレクター" OR "集電" OR "収集器" OR "集光器" OR "捕集器" OR "回収器") OR ZH_AB:("传感器" OR "集热器" OR "捕收剂" OR "尘器" OR "集器" OR "收集") OR KO_AB:("센서" OR "집열기" OR "수집기의" OR "집열장치" OR "회수기" OR "콜렉터" OR "집열판" OR "집진 장치" OR "수거장치")

Query Assistant Query Examples

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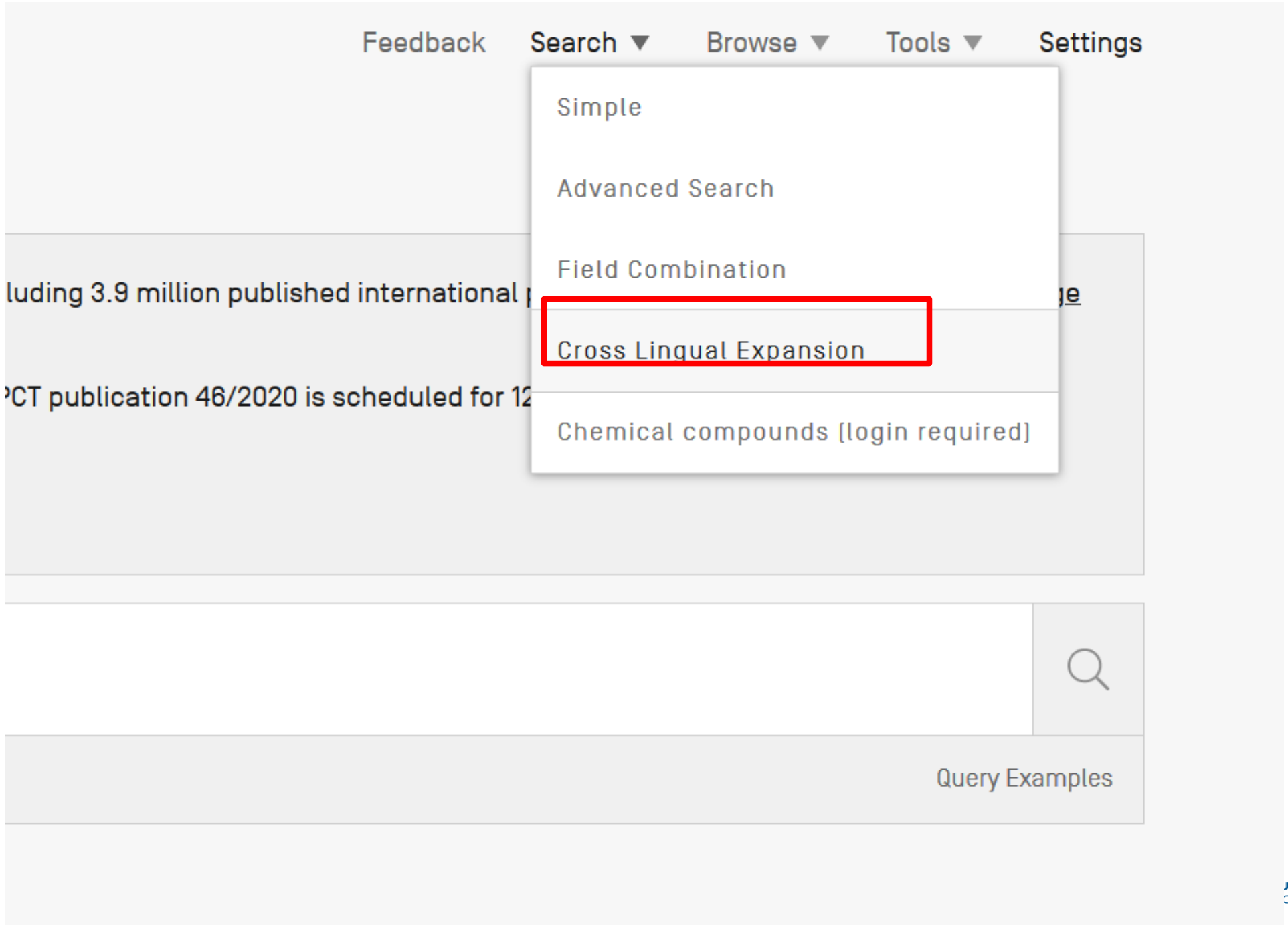
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Chemical compounds (login required)
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ge
CT publication 46/2020 is scheduled for 12
Query Examples

```
EN_AB:("water bottle")
```

“….” = exact expression

```
EN_AB:("water bottle"^4 AND cap)
```

^ = weight to word or phrase

```
EN_AB:(water NEAR5 bottle)
```

NEAR= keywords close to each other – order not relevant

```
EN_AB:(water BEFORE3 bottle)
```

BEFORE= order relevant

```
EN_AB: (water bottle)
```

(…) = keyword to be searched in field

ADVANCED SEARCH ▼

Search terms...

Query Assistant Query Examples

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Offices
All

Languages
All

Stemming

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IC:"F24S"

41,410 results | Offices all | Languages all | Stemming true | Single Family Member false | Include NPL false

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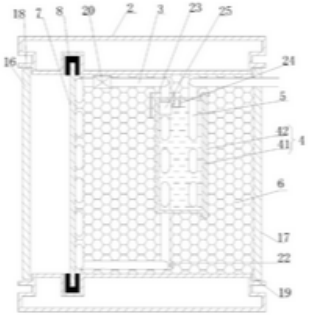
1. **211316601** PLATE-TUBE TYPE PHASE-CHANGE SOLAR WATER HEATER — CN - 21.08.2020

Int.Class F24S 10/70 **Appl.No** 201922009415.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

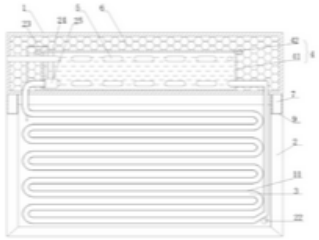
The utility model discloses a plate tube type phase change solar water heater which comprises a heat absorption plate frame, a heat absorption plate is arranged on the heat absorption plate frame, anda heat conduction pipeline is arranged on the back face of the heat absorption plate. The heat absorption plate frame is further provided with a back plate, the heat absorption plate frame, the heatabsorption plate and the back plate form a closed space, an inner material box is arranged in the space, and the interior of the inner material box is filled with heat preservation materials. The heatconduction pipeline is a circulating pipe and penetrates through the inner material box; an inlet and an outlet of the water supply pipeline are formed in the heat absorption plate frame, the middlesection penetrates through the inner material box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner material box absorbs solar heat in the daytime andstores the heat, when hot water needs to be used, cold water is heated through the inner material box, the hot water is discharged, the solar water heater is suitable for rainy days after high temperature, after the inner material box is heated, the influence of the environment with low external rainy day temperature on the inner material box is small, heat loss is slow, and a water supply pipeline can still be heated in cloudy and rainy days.



2. **111043773** TUBULAR PHASE CHANGE SOLAR WATER HEATER — CN - 21.04.2020

Int.Class F24S 10/70 **Appl.No** 201911135675.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

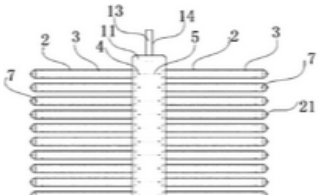
The invention discloses a tubular phase change solar water heater. The tubular phase change solar water heater comprises a storage box shell. The lower portion of the storage box shell is connected with a heat absorption plate frame, a glass heat absorption pipe is erected in the heat absorption plate frame through a support, and a heat conduction pipeline is arranged in the glass heat absorptionpipe. An inner box is placed in the storage box shell, and the clearance between the inner box and the storage box shell is filled with an insulating material. The heat conduction pipe is a circulating pipe and penetrates the inner box in the storage box shell. A water supply pipeline is further included. An outlet and an inlet of the water supply pipeline are all arranged on the storage box shell, the middle segment of the water supply pipeline penetrates through the inner box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner box absorbs solarheat in the daytime and stores the heat, when hot water is needed, cold water is warmed through the inner box, hot water is output, and the solar water heater is suitable for rainy days after high temperature; and after the inner box is warmed, the influenced of the environment where the temperature is low in rainy days is small, heat losses are slow, and the water supply pipeline can still be heated in overcast and rainy weather.



3. **207527861** MODIFIED EVACUATED COLLECTOR TUBE — CN - 22.06.2018

Int.Class F24S 10/40 **Appl.No** 201720987344.5 **Applicant** YUNNAN HUIBIAO NEW ENERGY TECHNOLOGY CO., LTD. **Inventor** HUANGFU JIANGUAN

The utility model discloses a modified evacuated collector tube, the mutual disposition is allying oneself with taking the vacuum tube of cavity and setting up that seal the inner in the vacuum tube cavity, outer end open -ended heat conduction branch pipe of soot collector both sides including about the array, and it is still including being equipped with the connecting elements, and the outer end opening part of each vacuum tube and heat conduction branch pipe is transversely located to the connecting elements, and each group interconnects as an organic wholely through a pair of connecting elements and the connecting elements of both sides of drawing between the relative vacuum tube each other mutually. The utility model discloses because the auxiliary connection has drawing the connecting elements between relative vacuum tube, can ensure it conduct heat to connect reliability and manages to drop easily with preventing vacuum and cause the unreliable problem of work, can make it exist at the metal heat pipe still can keep at utmost contact heat transfer with the glass evacuated collector tube inner wall under the influence of installation form and position error, from the structural whole efficiency of solar vacuum tubular collector



IC:"F24S"

41,410 results Offices all Languages all Stemming true Single Family Member false Include NPL false

REFINE OPTIONS

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Languages
All

- [x] Stemming
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IC:"F24S"

37,738 results | Offices all | Languages all | Stemming true | Single Family Member true | Include NPL false

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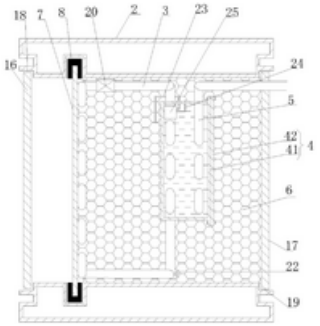
1. **211316601** PLATE-TUBE TYPE PHASE-CHANGE SOLAR WATER HEATER — CN - 21.08.2020

Int.Class F24S 10/70 **Appl.No** 201922009415.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

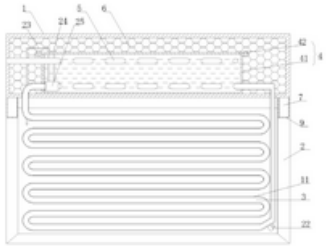
The utility model discloses a plate tube type phase change solar water heater which comprises a heat absorption plate frame, a heat absorption plate is arranged on the heat absorption plate frame, anda heat conduction pipeline is arranged on the back face of the heat absorption plate. The heat absorption plate frame is further provided with a back plate, the heat absorption plate frame, the heatabsorption plate and the back plate form a closed space, an inner material box is arranged in the space, and the interior of the inner material box is filled with heat preservation materials. The heatconduction pipeline is a circulating pipe and penetrates through the inner material box; an inlet and an outlet of the water supply pipeline are formed in the heat absorption plate frame, the middlesection penetrates through the inner material box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner material box absorbs solar heat in the daytime andstores the heat, when hot water needs to be used, cold water is heated through the inner material box, the hot water is discharged, the solar water heater is suitable for rainy days after high temperature, after the inner material box is heated, the influence of the environment with low external rainy day temperature on the inner material box is small, heat loss is slow, and a water supply pipeline can still be heated in cloudy and rainy days.



2. **111043773** TUBULAR PHASE CHANGE SOLAR WATER HEATER — CN - 21.04.2020

Int.Class F24S 10/70 **Appl.No** 201911135675.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

The invention discloses a tubular phase change solar water heater. The tubular phase change solar water heater comprises a storage box shell. The lower portion of the storage box shell is connected with a heat absorption plate frame, a glass heat absorption pipe is erected in the heat absorption plate frame through a support, and a heat conduction pipeline is arranged in the glass heat absorptionpipe. An inner box is placed in the storage box shell, and the clearance between the inner box and the storage box shell is filled with an insulating material. The heat conduction pipe is a circulating pipe and penetrates the inner box in the storage box shell. A water supply pipeline is further included. An outlet and an inlet of the water supply pipeline are all arranged on the storage box shell, the middle segment of the water supply pipeline penetrates through the inner box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner box absorbs solarheat in the daytime and stores the heat, when hot water is needed, cold water is warmed through the inner box, hot water is output, and the solar water heater is suitable for rainy days after high temperature; and after the inner box is warmed, the influenced of the environment where the temperature is low in rainy days is small, heat losses are slow, and the water supply pipeline can still be heated in overcast and rainy weather.



3. **207527861** MODIFIED EVACUATED COLLECTOR TUBE — CN - 22.06.2018

6. WO2018195130 - MONOLITHIC MACRO-FLUIDIC HEAT TRANSFER COMPONENTS AND METHODS FOR MANUFACTURING SAME

Publication Number
WO/2018/195130

Publication Date
25.10.2018

International Application No.
PCT/US2018/028042

International Filing Date
17.04.2018

IPC
F24S 50/80 2018.1 | F24S 60/00 2018.1 | F24S 60/30 2018.1 | F24S 80/00 2018.1 | F24S 80/10 2018.1 | F24S 80/20 2018.1
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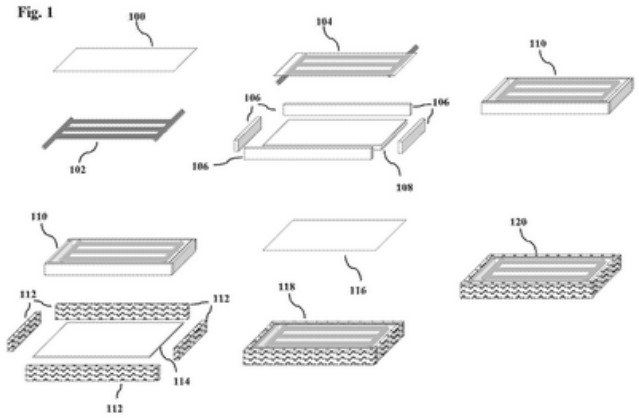
Applicants
MILES, Mark W. [US]/[US]

Title
[EN] MONOLITHIC MACRO-FLUIDIC HEAT TRANSFER COMPONENTS AND METHODS FOR MANUFACTURING SAME
[FR] ÉLÉMENTS MONOLITHIQUES DE TRANSFERT DE CHALEUR MACRO-FLUIDIQUE ET LEURS PROCÉDÉS DE FABRICATION



Abstract
[EN] A solar collector is provided. The collector comprises a monolithic flow control component to direct a flow of the heat transfer fluid between an inlet and outlet; and a solar absorber supported by the monolithic flow control component. The monolithic flow control component is able to support the solar absorber without any additional structural components to lend mechanical strength to the monolithic flow control component.
[FR] La présente invention concerne un capteur solaire. Le capteur comprend un élément monolithique de commande d'écoulement destiné à diriger un écoulement du fluide de transfert de chaleur entre une entrée et une sortie ; et un absorbeur solaire porté par l'élément monolithique de commande d'écoulement. L'élément monolithique de commande d'écoulement peut porter l'absorbeur solaire sans utilisation d'éléments structurels supplémentaires, afin de conférer une résistance mécanique à l'élément monolithique de commande d'écoulement

6. WO2018195130 - MONOLITHIC MACRO-FLUIDIC HEAT TRANSFER COMPONENTS AND METHODS FOR MANUFACTURING SAME

PCT Biblio. Data | Description | Claims | Drawings | National Phase | Patent Family | Notices | Documents

PermaLink

0299167

3/195130

Tue 17	Wed 18	Thu 19	Fri 20	Sat 21	Sun 22	Mon 23

April 2018

US20180299167 MONOLITHIC MACRO-FLUIDIC HEAT TRANSFER COMPONENTS AND METHODS FOR MANUFACTURING SAME

Appl.Date 17.04.2018

Appl.No 15955663 Applicant Mark W. MILES Pub.Kind A1

Inclusion Criteria IC4 Pub.Date 18.10.2018

US application related to another US application already included in the family.

The former is either a division, continuation, reissue or republication of the latter.

WO/2018/195130 MONOLITHIC MACRO-FLUIDIC HEAT TRANSFER COMPONENTS AND METHODS FOR MANUFACTURING SAME

Appl.No PCT/US2018/028042 Applicant MILES, Mark W. Pub.Kind A Pub.Lang en

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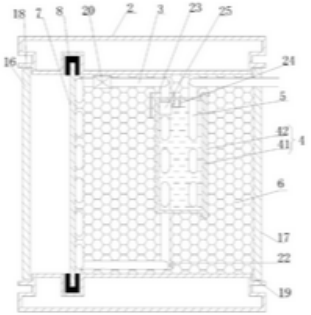
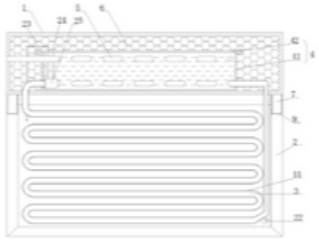


2. **111043773** TUBULAR PHASE CHANGE SOLAR WATER HEATER — CN - 21.04.2020

Int.Class F24S 10/70 **Appl.No** 201911135675.6 **Applicant** ZHANG CHUANDONG **Inventor** ZHANG CHUANDONG

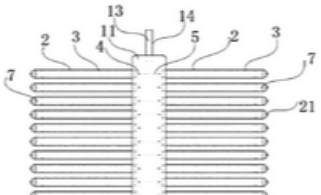
The invention discloses a tubular phase change solar water heater. The tubular phase change solar water heater comprises a storage box shell. The lower portion of the storage box shell is connected with a heat absorption plate frame, a glass heat absorption pipe is erected in the heat absorption plate frame through a support, and a heat conduction pipeline is arranged in the glass heat absorptionpipe. An inner box is placed in the storage box shell, and the clearance between the inner box and the storage box shell is filled with an insulating material. The heat conduction pipe is a circulating pipe and penetrates the inner box in the storage box shell. A water supply pipeline is further included. An outlet and an inlet of the water supply pipeline are all arranged on the storage box shell, the middle segment of the water supply pipeline penetrates through the inner box, the inlet is connected with cold water, and the outlet is connected with domestic water. The inner box absorbs solarheat in the daytime and stores the heat, when hot water is needed, cold water is warmed through the inner box, hot water is output, and the solar water heater is suitable for rainy days after high temperature; and after the inner box is warmed, the influenced of the environment where the temperature is low in rainy days is small, heat losses are slow, and the water supply pipeline can still be heated in overcast and rainy weather.



3. **207527861** MODIFIED EVACUATED COLLECTOR TUBE — CN - 22.06.2018

Int.Class F24S 10/40 **Appl.No** 201720987344.5 **Applicant** YUNNAN HUIBIAO NEW ENERGY TECHNOLOGY CO., LTD. **Inventor** HUANGFU JIANGUAN

The utility model discloses a modified evacuated collector tube, the mutual disposition is allying oneself with taking the vacuum tube of cavity and setting up that seal the inner in the vacuum tube cavity, outer end open -ended heat conduction branch pipe of soot collector both sides including about the array, and it is still including being equipped with the connecting elements, and the outer end opening part of each vacuum tube and heat conduction branch pipe is transversely located to the connecting elements, and each group interconnects as an organic wholely through a pair of connecting elements and the connecting elements of both sides of drawing between the relative vacuum tube each other mutually. The utility model discloses because the auxiliary connection has drawing the connecting elements between relative vacuum tube, can ensure it conduct heat to connect reliability and manages to drop easily with preventing vacuum and cause the unreliable problem of work, can make it exist at the metal heat pipe still can keep at utmost contact heat transfer with the glass evacuated collector tube inner wall under the influence of installation form and position error, from the structural whole efficiency of solar vacuum tubular collector



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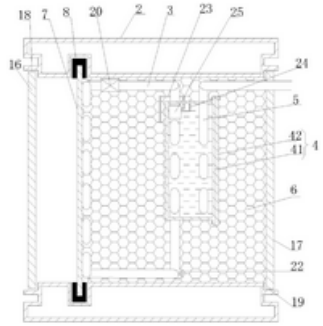

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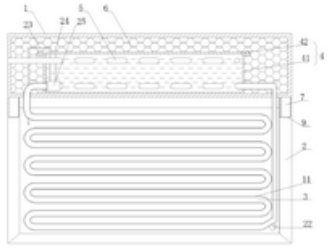

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Int.Class F24S 10/40 Appl.No 201720987344.5 Applicant YUNNAN HUIBIAO NEW ENERGY TECHNOLOGY CO., LTD. Inventor HUANGFU JIANGJUN

Republic of Korea	324	Republic of Korea	372	QINGDAO ECONOMIC AND TECH DEVELOPMENT ZONE HAIER WATER HEATER CO LTD	68	F24H	1,114	y02e 10/52	1,507	2003	122	A2	260
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Israel	74	Slovakia	106			B01D	443	f24s 60/30	769	2017	996		
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January 2022

Peter OKSEN, Green Technology and Research Manager, Climate Change and Food Security, Global Challenges Division, Global Challenges and Partnerships Sector

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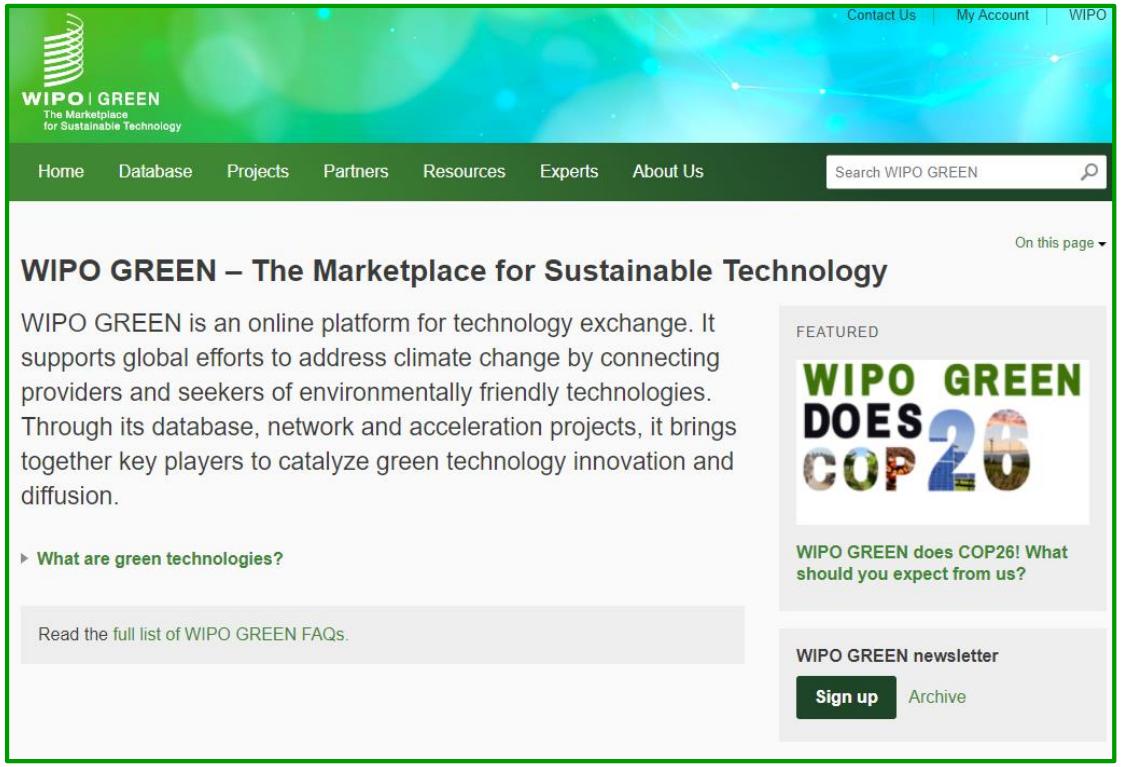

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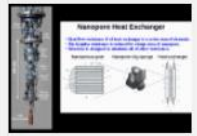

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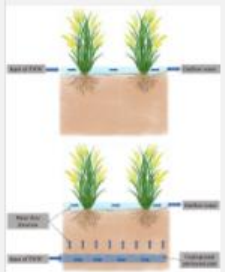

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ENERGY > BIOMASS/BIOENERGY | ENERGY > WASTE TO ENERGY

Hydrogen Sulfide Bio-scrubber

Organics designs and manufactures vertical and horizontal bio scrubbers that can reduce the hydrogen sulfide down to 100 ppm and counter the threat of corrosion related to the production of H2S in landfilled waste or anaerobic digestion systems. The main advantage of the system is that, in most circumstances, no additional costs for chemical additions are incurred. The bacteria involved in the process are ubiquitous and, as long as correct environmental conditions are maintained, the bacteria wi ...

Owner	PT Organics Bali
Uploaded by	ade sri rahayu
Type	Technology
Source	User uploads
Published	Sep 6, 2021
Readiness level (TRL)	Scaling up (TRL 9)
Developed in	Indonesia

ID 138648

ENERGY > BIOMASS/BIOENERGY | ENERGY > WASTE TO ENERGY

Biogas Upgrading & Distribution (CBG)

Safe S.p.A. provides turnkey solutions for biogas upgrading & distribution at low, medium, and high pressures for either grid injection, bulk transportation, or NGV filling. Safe S.p.A. is the preferred technology partner for many international customers who seek trouble-free and feasible development of their biogas to biomethane (CBG) projects. Thanks to our global partners' network, we are always near to our customers for the best sales and after-sales support.

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Uploaded by	ade sri rahayu
Type	Technology
Source	User uploads
Published	Sep 6, 2021
Readiness level (TRL)	Scaling up (TRL 9)
Developed in	Italy

ID 138647

Biological H2S Scrubber

ENERGY > BIOMASS/BIOENERGY | ENERGY > WASTE TO ENERGY

ID	138631
Owner	Biogasclean A/S Denmark
Uploaded by	Winrock International
Type	Technology
Source	User uploads
Published	Aug 20, 2021
Updated	Aug 26, 2021

EMAIL OWNER VISIT WEBSITE

Biogasclean A/S Denmark

Description | Benefits | Other Information

Biogasclean is a world leader in biological desulfurization of biogas and Biogasclean is specialized in biological desulfurization of biogas. We develop, manufacture, and market fully automated gas cleaning systems for H2S removal combining low operating costs with high availability. Our track record comprises +285 plants in operation or under construction in 40 countries. Biogasclean supplies clean gas to +600 MW gas engines and boilers. Furthermore, we remove sulfur on +20 biogas plants where the biogas is upgraded to biomethane or Renewable Natural Gas (RNG).

The most important differences between Biogasclean's solutions and alternative biological H2S removal systems are safety and automatic reliable operation.

Biogasclean's H2S removal process is 100% biological and operating costs 70–80 % lower than chemical gas cleaning systems as Biogasclean's systems neither consume caustic soda nor require frequent media replacement such as an iron sponge, activated carbon, etc. The availability is above 98%. The only residue from the process is a valuable liquid fertilizer.

Key features:
• Safety. Biogasclean systems are supplied with a control system that will adjust air injection to the actual biogas flow and stop air injection in case there is no biogas flow. If the PTU is closed, the safety system will also remove the ignition source by cutting the power supply in case the gas detector should measure methane above 25% of the Lower Explosive Level (LEL).
• Automatic reliable operation. The system is automatically controlled by the PLC controller board which reduces the risk for manual errors and operating problems. The main function is to provide safe, optimal, and stable conditions for the biological process.
• Low operating costs. The system uses no chemicals and has very low electrical consumption. In many projects, treated water from an anaerobic digester or an aeration pond is used as a scrubber liquid and nutrient source.
• Guaranteed performance. Biogasclean provides performance guarantees on all projects.

Keywords Biogas scrubber, H2S removal, biological desulfurization,

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solar | Simple | Search | Full Text Search

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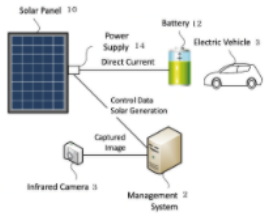
ENERGY > SOLAR



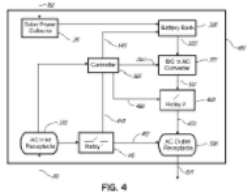
Kanazawa Institute of Technology: *Solar* power generation system, *solar* power generation management method, and program

The *solar* power generation system has a power generation prediction unit that predicts the amount of power generated by the *solar* panel based on weather information for the region including the installation site of the *solar* panel, a power generation acquisition unit that acquires the amount of power generated by the *solar* panel, and a failure possibility diagnosis unit that determines the possibility of failure of the *solar* panel based on the amount of power generated predicted by the power gen ...

Owner	Kanazawa Institute of Technology
Uploaded by	SUWA YORIMASA
Type	Technology
Source	User uploads
Published	Mar 22, 2021
Readiness level (TRL)	Proof of concept (TRL 3-4)
Developed in	Japan

ID 20583

ENERGY > SOLAR



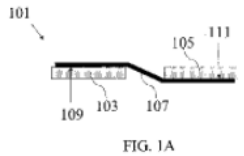
INTEGRATED *SOLAR* PANEL

A *solar* panel (400) is disclosed that can be daisy-chained with other *solar* panels (100a- n). The *solar* panel (400) automatically generates output alternative current (AC) power (195) that is in parallel with input AC power (112) coming into the *solar* panel (400) when the *solar* panel (400) senses the input AC power (112) so that the *solar* panel (400) operates as a slave in this state. The *solar* panel (400) automatically generates standalone AC output power (195) when the *solar* panel (400) fails ...

Owner	SUNCULTURE *SOLAR* INC.
Uploaded by	WIPO GREEN Import
Type	Technology
Source	Patentscope
Published	Sep 18, 2014

ID 37233

ENERGY > SOLAR



INTERCONNECTED *SOLAR* CELLS

Interconnected *solar* cells include a first *solar* cell and a second *solar* cell connected by a wire with a coefficient of thermal expansion matched to the first *solar* cell's coefficient of thermal expansion.

Owner	EVERGREEN *SOLAR*, INC.
Uploaded by	WIPO GREEN Import
Type	Technology
Source	Patentscope

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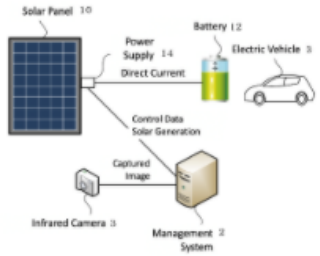

Kanazawa Institute of Technology: *Solar* power generation system, *solar* power generation management method, and program

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Uploaded by	SUWA YORIMASA
Type	Technology
Source	User uploads
Published	Mar 22, 2021
Readiness level (TRL)	Proof of concept (TRL 3-4)
Developed in	Japan

ID 205

ENERGY > SOLAR

INTEGRATED *SOLAR* PANEL

A *solar* panel (400) is disclosed that can be daisy-chained with other *solar* panels (100a- n). The *solar* panel (400) automatically

Owner	SUNCULTURE *SOLAR* INC.

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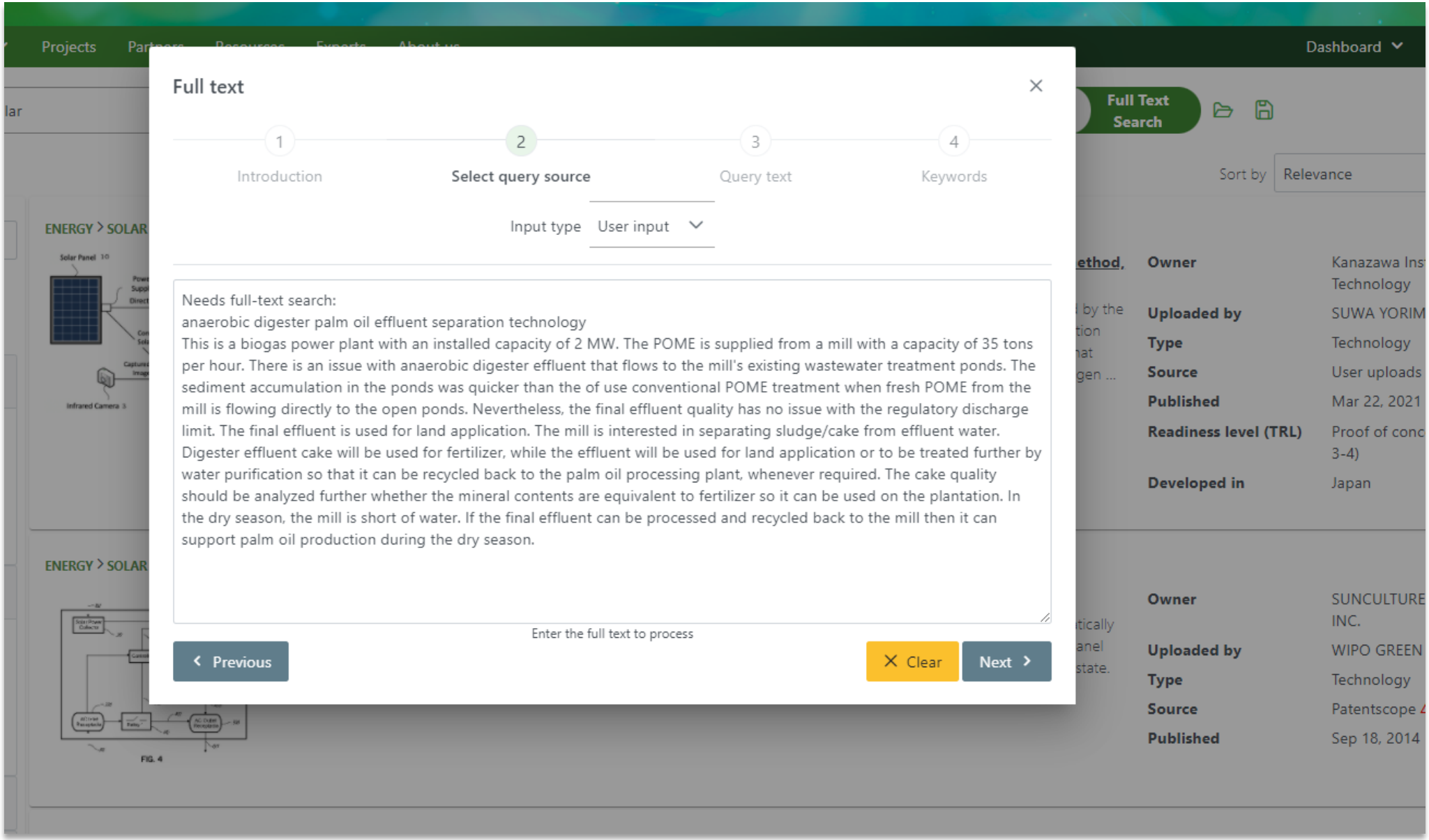

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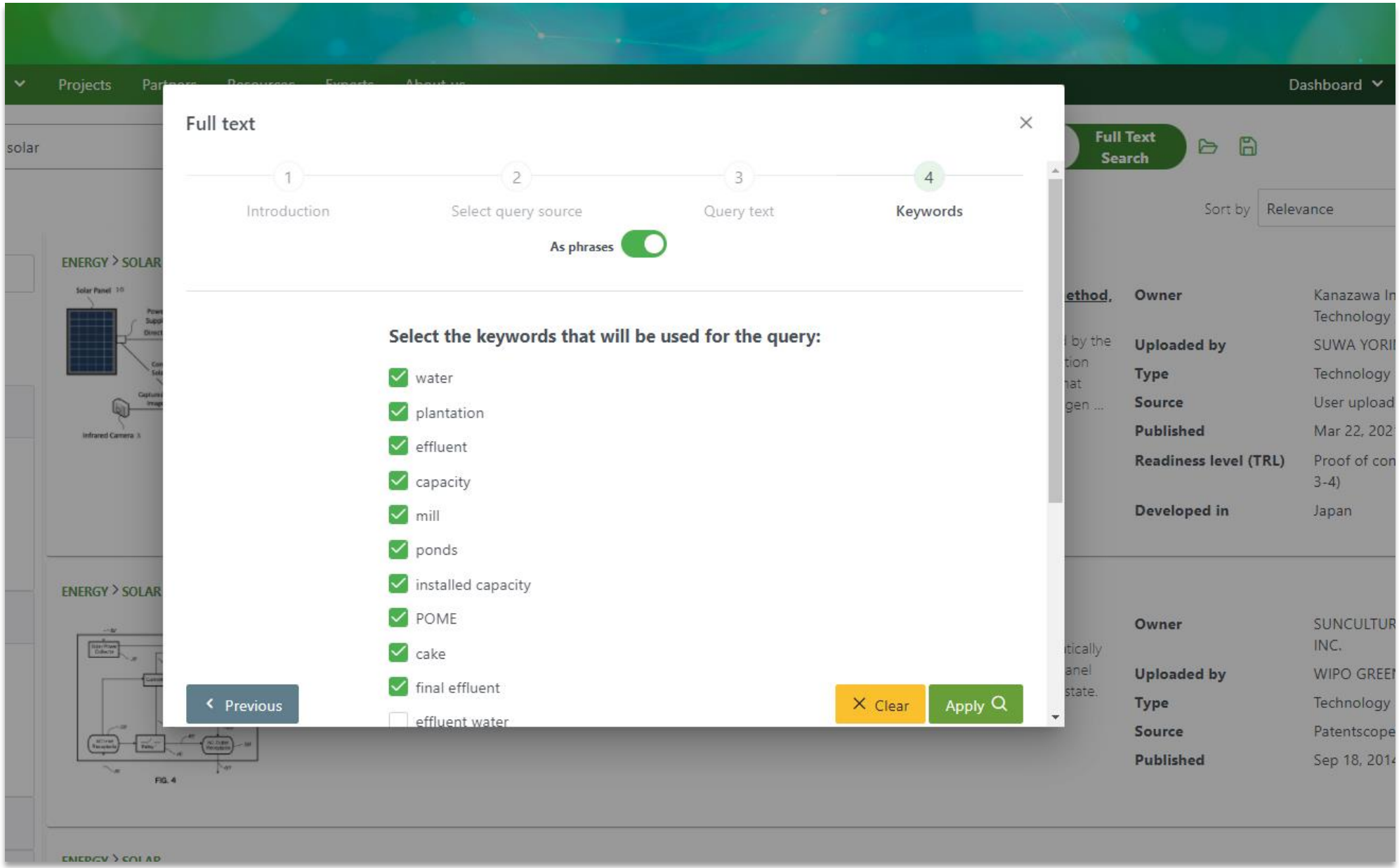

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"water" "plantation" "effluent" "capacity" "mill" "ponds" "installed capacity" "POME" "cake" "final effluent" | Simple | Search | Full Text Search

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POLLUTION & WASTE > WASTEWATER TREATMENT

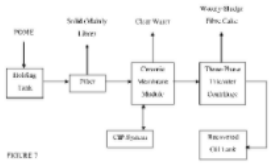
TREATMENT OF WASTEWATER

A method and apparatus for the treatment of waste *water*, said method comprises the steps of (a) pre-treatment of the wastewater with ozone; and (b) biological treatment of the *water* from step (a).

Owner	HYGIENELAND (SINGAPORE) PTE. LTD.
Uploaded by	WIPO GREEN Import
Type	Technology
Source	Patentscope
Published	May 10, 2007

ID 78585

POLLUTION & WASTE > RECYCLING & REUSE



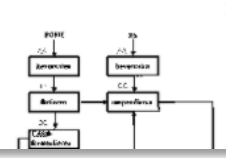
A METHOD OF RECOVERING OIL FROM VEGETABLE OIL *MILL EFFLUENT*

The present invention discloses a method of recovering oil from a vegetable oil *mill effluent* comprising the steps of reducing viscosity of the *effluent* by heating to a temperature of 50-95 oC; filtering the heated *effluent* to remove solids; passing the treated *effluent* into a ceramic membrane module (1) to separate of oil and *water* into a filtrate and a concentrate; and recovering oil by centrifuge the concentrate from the ceramic membrane module (1), wherein the ceramic membrane module (1) com ...

Owner	GENIUS VENTURE WORLDWIDE LIMITED
Uploaded by	WIPO GREEN Import
Type	Technology
Source	Patentscope
Published	Aug 4, 2016

ID 42356

POLLUTION & WASTE > RECYCLING & REUSE | PRODUCT, MATERIALS AND PROCESSES > CHEMICAL & INDUSTRIAL PROCESSES | FARMING & FORESTRY > IMPROVED FARM INPUTS



PROCESS FOR MATERIAL AND ENERGY RECOVERY OF LIQUID AND FINELY DIVIDED RESIDUES FROM PALM OIL EXTRACTION

The present invention specifies a technical solution by means of which liquid (1) and finely divided residues from palm oil extraction are recovered while avoiding environmental pollution. To this end, proven biotechnological process steps are employed such that the potential of biogenic carbon present in the residues remains largely energetically unlocked and the plant nutrients present in the residues remain preserved in a predominantly plant-available form. To this end, fat fractions and

Owner	APELT, Christine
Uploaded by	WIPO GREEN Import
Type	Technology
Source	Patentscope

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ZERO DISCHARGE TREATMENT SYSTEM OF PALM OIL MILL EFFLUENT (POME)

POLLUTION & WASTE > RECYCLING & REUSE | FARMING & FORESTRY > IMPROVED FARM INPUTS

Patent2Solution

ID	60274
Applicant	RONSER BIO-TECH SDN BHD
Uploaded by	WIPO GREEN Import
Type	Technology
Source	Patentscope
Published	Nov 14, 2013
Updated	Jul 12, 2021

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RONSER BIO-TECH SDN BHD

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Description Details Other Information Attachments

The present invention relates to establishment of a zero discharge treatment technology of POME mainly routed in (1) pre-treatment, (2) biological treatment and (3) membrane separation. The ultimate goals of the developed zero discharge POME treatment technology are: (1) produce biogas as a source of renewable energy, (2) zero emissions of POME into the atmosphere, (3) final discharge of BOD 20 ppm or below; (4) clean water for use as boiler feed water and (5) recover potash rich fertilizer, which are of great values to the palm oil milling process.

Patent2Solution

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Results related to ZERO DISCHARGE TREATMENT SYSTEM OF PALM OIL MILL EFFLUENT (POME)

Editable keywords used: ZERO DISCHARGE TREATMENT PALM OIL environmental policies water Search

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www.linkedin.com > company > ronser-bio-tech-berhad

Ronser Bio-Tech Berhad | LinkedIn

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Source: GOOGLE

www.crunchbase.com > organization > ronser-bio-tech-sdn-bhd

RONSER Bio-Tech Sdn Bhd - Crunchbase Company Profile ...

RONSER Bio-Tech Sdn Bhd provides environmental facilities and engages in the treatment of industrial high organic wastewater.

Source: GOOGLE

www.facebook.com > ronserbiotech >

Ronser Bio-Tech Berhad - Home | Facebook

Ronser Bio-Tech Bhd, a **BioNexus** status company, is an INTEGRATED WASTEWATER TREATMENT SOLUTIONS specialist offering multi-disciplinary environmental services in ...

Source: GOOGLE

www.alfalaval.com > industries > food-dairy-beverage > food-processing > fat-and-oil-processing > palm-oil-processing > pome-treatment >

Palm oil mill effluent POME treatment - Alfa Laval

Traditional **treatment** methods place demands on millers, particularly in the face of strict **environmental** regulations. Drawing from our knowledge of evaporation ...

Source: GOOGLE

onlinelibrary.wiley.com > doi > abs > 10.1002 > 9781119478911.ch20

Water Recycling from Palm Oil Mill Effluent - Handbook of Water ...

Jan 8, 2021 **...** Summary Nowadays, **oil palm** production in Malaysia has reached 20 000 000 tons. The conventional **treatment** method for **palm oil** mill effluent ...

Source: GOOGLE

iwaponline.com > wst > article > 73 > 11 > 2704 > 19121 > Polishing-of-treated-palm-oil-mill-effluent-POME

Polishing of treated palm oil mill effluent (POME) from ponding ...

Mar 7, 2016 **...** As the ponding system used to **treat palm oil** mill effluent (POME) frequently fails to satisfy the **discharge** standard in Malaysia, ...

Source: GOOGLE

us.pg.com > environmental-sustainability >

Environmental Sustainability | Procter & Gamble

NET **ZERO** AMBITION BY 2040. In September 2021, P&G set a new ambition to achieve net **zero** greenhouse gas (GHG) emissions across its operations and supply chain ...

Source: GOOGLE

www.musimmas.com > sustainability > environmental-protection >

Environmental Protection - Musim Mas

As a major player in the **palm oil** sector, we have a significant role in promoting sustainable forest management in our industry. We also play a part in ...

Source: GOOGLE

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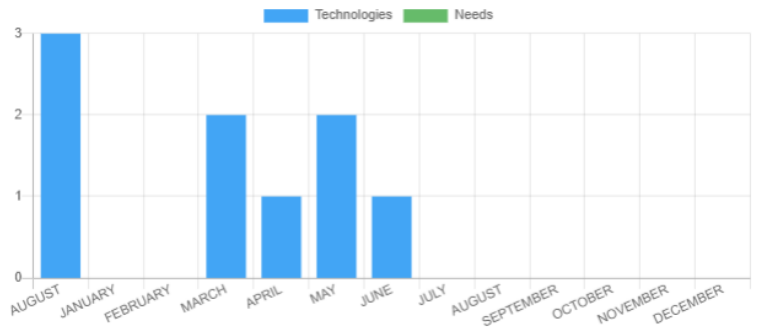

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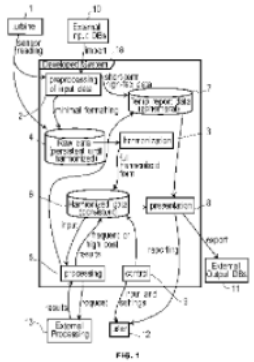

METHOD FOR CONTROLLED SHARING OF WIND FARMS AND WIND TURBINES DATA, DATA ANALYSIS ALGORITHMS, AND *RESULTS* OF DATA ANALYSIS

A method for controlled sharing of data, data analysis algorithms, and *results* of data analysis regarding one or a plurality of wind turbines and wind farms, and controlled access to said data, data analysis algorithms, and *results* of data analysis, comprising the following steps: 1. provision of sensor means for reading data relating to the operation of each wind turbine, respectively of each wind farm, of said plurality of wind turbines, respectively of wind farms, for monitoring the operating ...

Owner	WINDSTACK IVS
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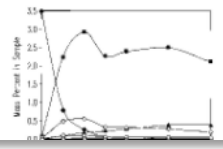
Type	Technology
Source	Patentscope
Published	Feb 7, 2019

ID 31288

PRODUCT, MATERIALS AND PROCESSES > CHEMICAL & INDUSTRIAL PROCESSES | ENERGY > BIOMASS/BIOENERGY



PALLADIUM CATALYZED HYDROGENATION OF BIO-OILS AND ORGANIC COMPOUNDS

The invention provides palladium-catalyzed hydro of bio-oils and certain organic compounds. Experimental *results* have shown unexpected and superior *results* for palladium-catalyzed hydro of organic compounds typically found in bio-oils.

Owner	BATTELLE MEMORIAL INSTITUTE
Uploaded by	WIPO GREEN Import
Type	Technology
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Caulys-Farm: smart indoor vertical farm

FARMING & FORESTRY > FARMING TECHNOLOGIES | FARMING & FORESTRY > GREENHOUSE & INDOOR

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Published	Aug 11, 2020
Updated	Nov 15, 2021

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Caulys SA

Description | Benefits | Other Information | Matching needs | Similar technologies | Statistics

Caulys-Farm is a smart vertical farm enabling to easily grow fresh food on site, with 95% saved water, all year long. This indoor farm settles in homes, community and gastronomic restaurants, and more. Our system is fully automated, little maintenance and no skills are required. Seed-Pods are provided: each contains seeds in an adapted growth environment. Users insert their Seed-Pods and the farm takes care of everything.

We aim to tackle the challenge of urban transition towards a sustainable agriculture in an increasingly populated planet. That means supporting traditional farming with a decentralized hyperlocal agriculture that lowers GHGE and pollution while saving our resources and our ecosystems. This is achieved by growing on site and suppressing produces' transportation, packaging and food losses from the fields to the end consumers.

Keywords Urban farming, hyper-local food, fresh food, sustainable food

Caulys-Farm: smart indoor vertical farm

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- Caulys-Farm: smart indoor vertical farm
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- SOIL-LESS INDOOR FARMING FOR FOOD AND ENERGY PRODUCTION, INCLUDING HIGH DENSITY THREE DIMENSIONAL MULTI-LAYER FARMING, PERMEABLE THREE DIMENSIONAL MULTI-LAYER FARMING AND CONTINUOUS FLOW FARMING OF MATERIAL PRODUCTS
- VERTICAL-HIVE GREEN BOX CULTIVATION SYSTEMS
- SOLAR POLY FARM FOR SOLAR POWER GENERATION AND AGRICULTURE
- MOBILE AND MODULAR CULTIVATION SYSTEMS FOR VERTICAL FARMING
- APPARATUS AND METHOD FOR AUTONOMOUS CONTROLLED ENVIRONMENT AGRICULTURE
- FERRIS WHEEL FARM
- CONTROLLED AGRICULTURAL SYSTEM AND METHOD FOR AGRICULTURE
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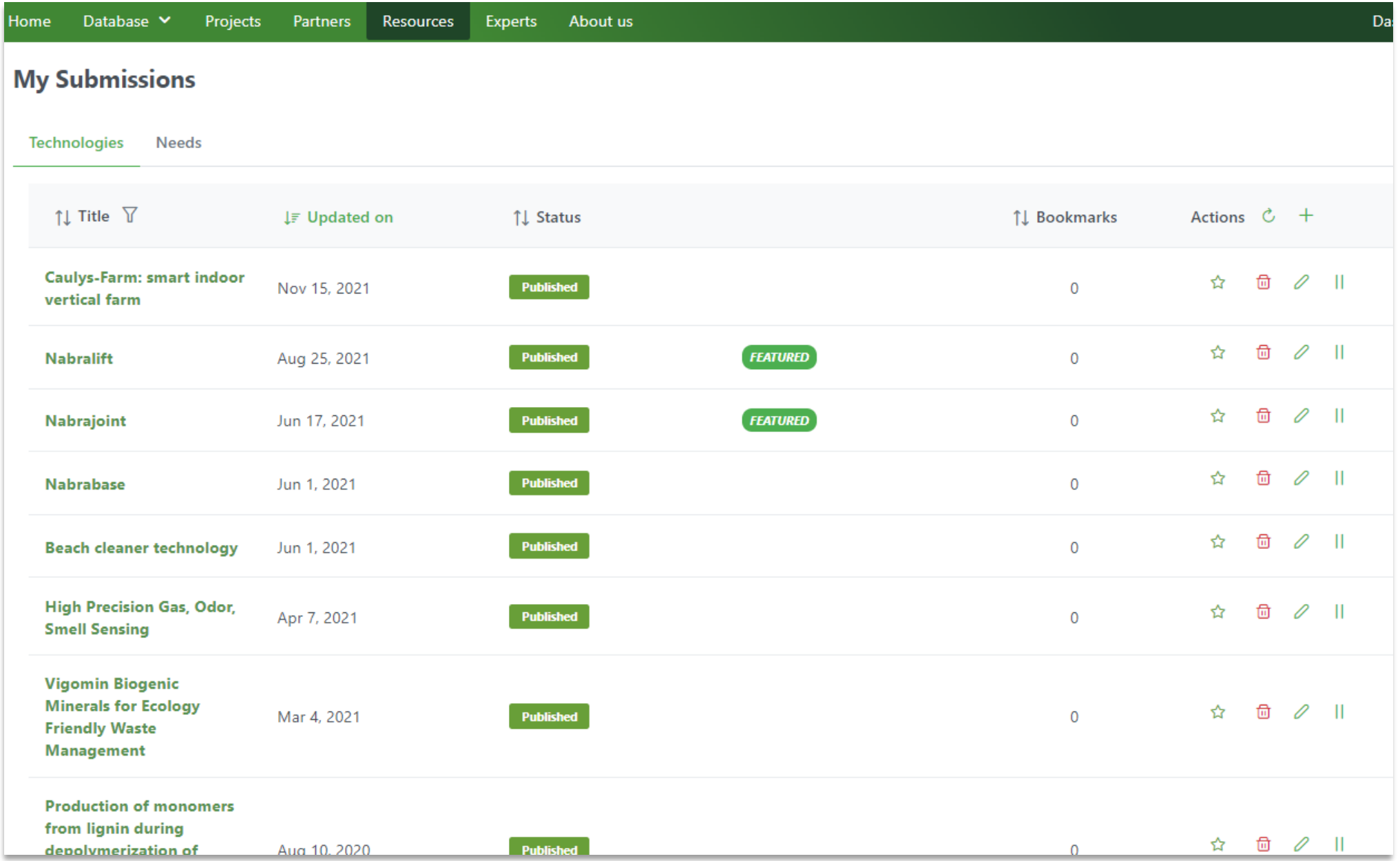
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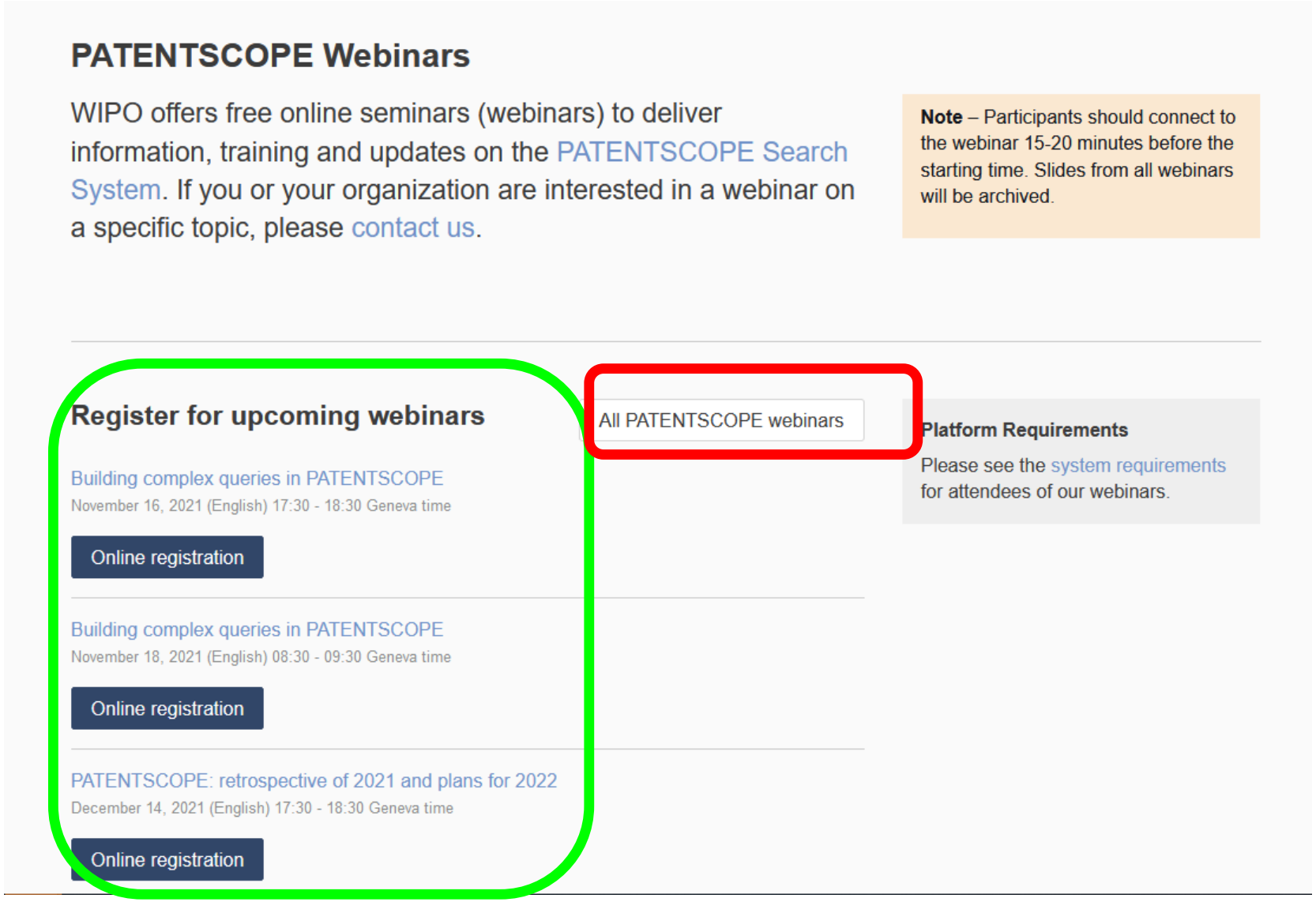

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