

[SS 17] hydroelectric and pressure and gradients and turbine and generator and wastewater

Results in EPODOC 0

[SS 18] hydroelectric and turbine and generator and wastewater

Results in EPODOC 10

[SS 19] ..li



1/10 © EPODOC / EPO

PN - [CN104612886](#) A 20150513

PR - KR20130133568 20131105

AP - CN20141200770 20140513

DT - I

CNOI - [F03B13/08](#)

CCA - [Y02E10/223](#) ; [Y02E10/28](#) ; [Y02E10/22](#)

CNOA - [F05B2220/706](#) ; [F05B2260/502](#)

PA - SE YOUNG ENGINEERING CO LTD; HWANG DONG-EON

TI - Small **hydroelectric generator** utilizing strom overflow diverging tank

AB - The present invention relates to a small hydro power device by using a soil inflow preventing device for producing electricity by using rain water or **wastewater** flowing from the end of a drainpipe while a hydraulic **turbine generator** is installed inside an opening/closing plate formed at the top of a rain water soil chamber. The small hydro power device by using the soil inflow preventing device according to the present invention in order to solve problems comprises: an opening/closing unit including a fixed frame fixed at an opening unit formed at the top of the rain water soil chamber, a fixed plate fixed at the top of the fixed frame and in which a sewage inlet is formed at one side, an assembly unit in which both ends are fixed at the fixed frame, and an opening/closing plate for opening/closing the sewage inlet while being integrally fixed to the assembly unit; a hydraulic **turbine generator** unit including a shaft in which both ends are fixed to the lateral wall of the rain water soil chamber while being arranged in the sewage inlet, a bearing unit installed at both ends of the shaft, and the hydraulic **turbine generator** fixed to be rotatable to the shaft; a power transmission unit including a spring accommodating pipe made of soluble materials and a power transmission spring built in the spring accommodating pipe and in which the driven side of the power transmission spring is fixed to one end of the shaft; and a power unit including a power chamber installed at the top of the end of the drainpipe and a **generator** installed at the power chamber and connected to the driving side of the power transmission spring to be fixed.

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PN - [CN104295430](#) A 20150121

PNFP - CN104295430B B 20170104

PR - KR20130083206 20130715

AP - CN20141201337 20140513

DT - I

CT - || STSE (A)  
[US8344536](#) B1 20130101 [A] (GOTAY VALENTINO [US]);  
[CN201209509Y](#) Y 20090318 [A] (UNIV SHANGHAI MARITIME [CN]);  
[KR101268137B](#) B1 20130527 [X] (HALLA ENGINEERING & CONSTRUCTION CORP [KR], et al)

CNOI - (A)  
[F03B13/00](#)

CCA - [Y02E10/223](#) ; [Y02E10/28](#)

PA - (A)  
SE YOUNG ENGINEERING CO LTD; HUANG DONGYAN

TI - (A)  
Small **hydroelectric generator** using sewage

AB - (A)  
The present invention relates to a small **hydroelectric generator** using sewage, which is installed between the end hole of a sewer pipe and an intercepting pipe, and able to produce electricity by using sewage flowing from the end hole of the sewer pipe. The small **hydroelectric generator** using sewage of the present invention in order to solve the problem is installed between the end hole of a sewer pipe and an intercepting pipe, and comprises a rainwater/**wastewater** pipe part fixed to the end hole of the sewer pipe on one end; a **turbine** room having a water wheel generater inside, a top through which the other end of the rainwater/**wastewater** pipe part penetrates, and a bottom with a drainpipe connected to the intercepting pipe; a power transfer unit including a shaft in gear with a rotary shaft of the water wheel **generator** ; and a generating room having a **generator** in gear with the shaft, wherein the water wheel **generator** is arranged on the outlet portion of the rainwater/**wastewater** pipe part, and the rotary shaft is vertically installed.

PN - [US2014341709](#) A1 20141120

PR - US201314083447  
20131119; US201261727748P  
20121119; US201361865337P  
20130813

AP - US201314083447 20131119

DT - \*; Rep

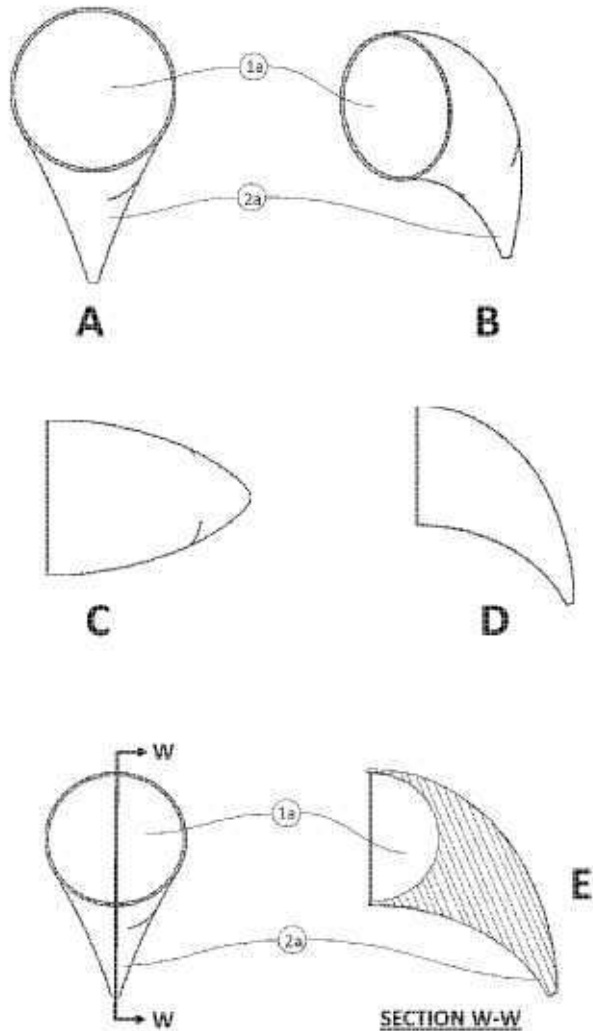
CCI - [F03B1/02](#) ; [F03B11/02](#)

CCA - [Y02E10/223](#) ; [Y02E10/226](#) ;  
[F05B2240/40](#)

PA - YAMODO INNOCENT HERVÉ [US]

TI - DOUBLE IMPULSE **TURBINE** SYSTEM

AB - A double impulse **turbine** system to convert the energy of flowing fluid into electricity is provided. The system takes fully advantage of the high efficiency and compactness provided by contra-rotating permanent magnet generators to produce electricity. It is composed of two impulse turbines, rotating in opposite directions and coaxially connected to a central contra-rotating **generator**. In function, a fluid flow is divided into secondary flows oriented directly and tangentially toward the turbines for a maximum energy transfer. The system comes with turbines having different bucket designs adapted for uses in particular environments. Special housings or **turbine** chambers are designed to carry the turbines and enable the conversion of the energy of a fluid flowing in pipes into electricity. This double impulse **turbine** system can be used to convert into electricity the energy of any fluid flowing in pipe as a flow or as a jet. It is provided to be used in and out urban environments in water supply distribution



and **wastewater** piping systems  
or **hydroelectric** plants in  
different conditions, such as  
presence or not of floating  
debris, flow rate or pressure.

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PN - [KR101352382B](#) B1 20140117  
PR - KR20130133568 20131105  
AP - KR20130133568 20131105  
DT - I  
CT - || STSE (B1)  
[KR100931316B](#) B1 20091211 [ ] (TOPS ENGINEERING CO LTD [KR]);  
[KR101026068B](#) B1 20110404 [ ] (JIN DOO NAM [KR]);  
[KR20070026704](#) A 20070308 [ ] (LEE KYUNG U [KR])  
CNOI - [F03B3/12](#) ; [F03B13/00](#) ; [F03B17/06](#)  
CCA - [Y02E10/223](#) ; [Y02E10/28](#) ; [Y02E10/22](#)  
CNOA - [Y02E10/22](#)  
PA - HWANG DONG EON [KR]; SE YOUNG ENGINEERING CO LTD [KR]  
TI - SMALL **HYDROELECTRIC GENERATOR** UTILIZING STROM OVERFLOW DIVERGING TANK  
AB - The present invention relates to a small hydro power device by using a soil inflow preventing device for producing electricity by using rain water or **wastewater** flowing from the end of a drainpipe while a hydraulic **turbine generator** is installed inside an opening/closing plate formed at the top of a rain water soil chamber. The small hydro power device by using the soil inflow preventing device according to the present invention in order to solve problems comprises: an opening/closing unit including a fixed frame fixed at an opening unit formed at the top of the rain water soil chamber, a fixed plate fixed at the top of the fixed frame and in which a sewage inlet is formed at one side, an assembly unit in which both ends are fixed at the fixed frame, and an opening/closing plate for opening/closing the sewage inlet while being integrally fixed to the assembly unit; a hydraulic **turbine generator** unit including a shaft in which both ends are fixed to the lateral wall of the rain water soil chamber while being arranged in the sewage inlet, a bearing unit installed at both ends of the shaft, and the hydraulic **turbine generator** fixed to be rotatable to the shaft; a power transmission unit including a spring accommodating pipe made of soluble materials and a power transmission spring built in the spring accommodating pipe and in which the driven side of the power transmission spring is fixed to one end of the shaft; and a power unit including a power chamber installed at the top of the end of the drainpipe and a **generator** installed at the power chamber and connected to the driving side of the power transmission spring to be fixed.

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PN - [KR101341860B](#) B1 20131217  
PR - KR20130083206 20130715  
AP - KR20130083206 20130715

DT - I

CNOI - [F03B13/083](#) ; [F03B17/062](#)

CCA - [Y02E10/223](#) ; [Y02E10/28](#)

CNOA - [F05B2220/32](#) ; [F05B2260/40](#)

PA - HWANG DONG EON [KR]; SE YOUNG ENGINEERING CO LTD [KR]

TI - SMALL **HYDROELECTRIC GENERATOR** USING SEWAGE

AB - The present invention relates to a small **hydroelectric generator** using sewage, which is installed between the end hole of a sewer pipe and an intercepting pipe, and able to produce electricity by using sewage flowing from the end hole of the sewer pipe. The small **hydroelectric generator** using sewage of the present invention in order to solve the problem is installed between the end hole of a sewer pipe and an intercepting pipe, and comprises a rainwater/**wastewater** pipe part fixed to the end hole of the sewer pipe on one end; a **turbine** room having a water wheel generater inside, a top through which the other end of the rainwater/**wastewater** pipe part penetrates, and a bottom with a drainpipe connected to the intercepting pipe; a power transfer unit including a shaft in gear with a rotary shaft of the water wheel **generator** ; and a generating room having a **generator** in gear with the shaft, wherein the water wheel **generator** is arranged on the outlet portion of the rainwater/**wastewater** pipe part, and the rotary shaft is vertically installed.

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PN - [US2001022085](#) A1 20010920

PR - US20010836967 20010417; US19970969712 19971114; US19950545110 19951019

AP - US20010836967 20010417

DT - \*; Rep

CCI - [F03G7/04](#)

CCA - [Y02E10/14](#) ; [F24T10/20](#)

TI - Method of combining **wastewater** treatment and power generation technologies

AB - Applicant's preferred embodiment utilizes municipal **wastewater** effluent to replenish a depleted geothermal field. Condensate produced by expanding steam produced in the geothermal field through a steam **turbine-generator** may be pooled with cooked water collected from said field, and then directed through a penstock from a higher elevation to a lower elevation where further energy is extracted through a traditional **hydroelectric turbine-generator**. The cooked water and condensate may be treated to produce potable water and/or distributed for public consumption either before or after being directed to the **hydroelectric turbine-generator**. The effluent is pumped up to the geothermal field during off-peak periods of electric consumption, and the **hydroelectric** generation is accomplished during periods of peak electric demand. A fraction of the effluent may be used as cooling water for the steam **turbine-generator** and its associated condenser before injection into the geothermal field. At least a portion of the pipeline to transport the **wastewater** effluent is preferably routed along an undisturbed riverbed and/or through an excavated tunnel.

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PN - [US2003046931](#) A1 20030313

PNFP - US6862886 B2 20050308

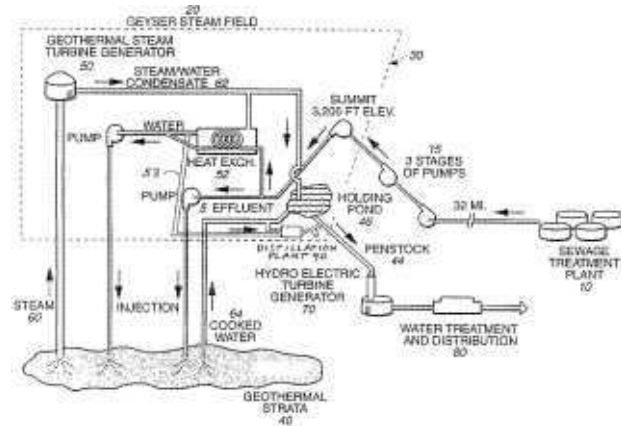
PR - US20020200993  
20020723; US20010836967  
20010417; US19970969712  
19971114; US19950545110  
19951019

AP - US20020200993 20020723

DT - \*\*

CT - || R141 (A1)  
[US4665281](#) A 19870512 [ ] (KAMIS ANTHONY G [US]);  
[US3962943](#) A 19760615 [ ] (ALLEN BURLA);  
[US4842248](#) A 19890627 [ ] (SHY MAX H [US]);  
[US5439363](#) A 19950808 [ ] (OWENS STEVE C [US], et al)  
- || STSE (B2)  
[US2962599](#) A 19601129 [ ] (PIRKEY FRANK Z);  
[US3962943](#) A 19760615 [ ] (ALLEN BURLA);  
[US4052858](#) A 19771011 [ ] (JEPPSON MORRIS R);  
[US4091623](#) A 19780530 [ ] (EDMONDSON JERRY M, et al);  
[US4542625](#) A 19850924 [ ] (BRONICKI LUCIEN Y [IL]);  
[US4665281](#) A 19870512 [ ] (KAMIS ANTHONY G [US]);  
[US4842248](#) A 19890627 [ ] (SHY MAX H [US]);  
[US5400598](#) A 19950328 [ ] (MORITZ ALEX [IL], et al);  
[US5439363](#) A 19950808 [ ] (OWENS STEVE C [US], et al);  
[US5484231](#) A 19960116 [ ] (CANNAN WILLIAM L [US], et al);  
[US5538598](#) A 19960723 [ ] (SCHLESINGER BARRY [US], et al);  
[US5925223](#) A 19990720 [ ] (SIMPSON GARY D [US], et al);  
[US6216463](#) B1 20010417 [ ] (STEWART LEONARD LEROUX [US])

CCI - [F03G7/04](#)



|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CCA | - <a href="#">Y02E10/14</a> ; <a href="#">F24T10/20</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| TI  | - (A1 B2)<br>Method of<br>combining <b>wastewater</b><br>treatment and power generation<br>technologies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| AB  | - (A1)<br>Applicant's preferred<br>embodiment utilizes<br>municipal <b>wastewater</b> effluent<br>to replenish a depleted<br>geothermal field. Condensate<br>produced by expanding steam<br>produced in the geothermal field<br>through a steam <b>turbine-</b><br><b>generator</b> may be pooled with<br>cooked water collected from said<br>field, and then directed through<br>a penstock from a higher<br>elevation to a lower elevation<br>where further energy is extracted<br>through a<br>traditional <b>hydroelectric turbine-</b><br><b>generator</b> The cooked water and<br>condensate may be treated to<br>produce potable water and/or<br>distributed for public<br>consumption either before or<br>after being directed to<br>the <b>hydroelectric turbine-</b><br><b>generator</b> . The effluent is<br>pumped up to the geothermal<br>field during off-peak periods of<br>electric consumption, and<br>the <b>hydroelectric</b> generation is<br>accomplished during periods of<br>peak electric demand A fraction<br>of the effluent may be used as<br>cooling water for the<br>steam <b>turbine-generator</b> and its<br>associated condenser before<br>injection into the geothermal<br>field. At least a portion of the<br>pipeline to transport<br>the <b>wastewater</b> effluent is<br>preferably routed along an<br>undisturbed riverbed and/or<br>through an excavated tunnel |

- (B2)

Applicant's preferred embodiment utilizes municipal **wastewater** effluent to replenish a depleted geothermal field. Condensate produced by expanding steam produced in the geothermal field through a steam **turbine-generator** may be pooled with cooled water collected from said field, and then directed through a penstock from a higher elevation to a lower elevation where further energy is extracted through a traditional **hydroelectric turbine-generator**. The cooled water and condensate may be treated to produce potable water and/or distributed for public consumption either before or after being directed to the **hydroelectric turbine-generator**. The effluent is pumped up to the geothermal field during off-peak periods of electric consumption, and the **hydroelectric** generation is accomplished during periods of peak electric demand. A fraction of the effluent may be used as cooling water for the steam **turbine-generator** and its associated condenser before injection into the geothermal field. At least a portion of the pipeline to transport the **wastewater** effluent is preferably routed along an undisturbed riverbed and/or through an excavated tunnel.

PN - [US2005160734](#) A1 20050728

PNFP - US7318315 B2 20080115

PR - US20050073315  
20050304; US20020200993  
20020723; US20010836967  
20010417; US19970969712  
19971114; US19950545110  
19951019

AP - US20050073315 20050304

DT - \*\*

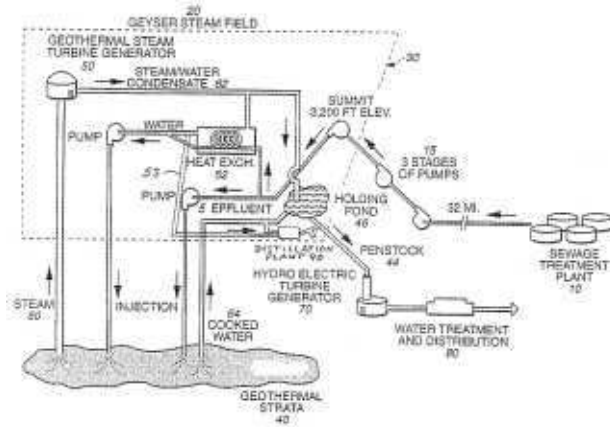
CT - || R141 (A1)  
[US5484231](#) A 19960116 [  
] (CANNAN WILLIAM L [US], et al);  
[US6216463](#) B1 20010417 [  
] (STEWART LEONARD LEROUX  
[US]);  
[US4091623](#) A 19780530 [  
] (EDMONDSON JERRY M, et al);  
[US3140986](#) A 19640714 [  
] (HUBBARD WALTER A);  
[US5441606](#) A 19950815 [  
] (SCHLESINGER BARRY [US], et al);  
[US4052858](#) A 19771011 [  
] (JEPPSON MORRIS R)  
- || STSE (B2)  
[US3140986](#) A 19640714 [  
] (HUBBARD WALTER A);  
[US4052858](#) A 19771011 [  
] (JEPPSON MORRIS R);  
[US4091623](#) A 19780530 [  
] (EDMONDSON JERRY M, et al);  
[US5441606](#) A 19950815 [  
] (SCHLESINGER BARRY [US], et al);  
[US5484231](#) A 19960116 [  
] (CANNAN WILLIAM L [US], et al);  
[US6216463](#) B1 20010417 [  
] (STEWART LEONARD LEROUX  
[US])

CCI - [F03G7/04](#)

CCA - [Y02E10/14](#) ; [F24T10/20](#)

TI - (A1 B2)  
Method of  
combining **wastewater**  
treatment and power generation  
technologies

AB - (A1 B2)  
Applicant's preferred



embodiment utilizes municipal **wastewater** effluent to replenish a depleted geothermal field. Condensate produced by expanding steam produced in the geothermal field through a steam **turbine-generator** may be pooled with cooled water collected from said field, and then directed through a penstock from a higher elevation to a lower elevation where further energy is extracted through a traditional **hydroelectric turbine-generator**. The cooled water and condensate may be treated to produce potable water and/or distributed for public consumption either before or after being directed to the **hydroelectric turbine-generator**. The effluent is pumped up to the geothermal field during off-peak periods of electric consumption, and the **hydroelectric** generation is accomplished during periods of peak electric demand. A fraction of the effluent may be used as cooling water for the steam **turbine-generator** and its associated condenser before injection into the geothermal field. At least a portion of the pipeline to transport the **wastewater** effluent is preferably routed along an undisturbed riverbed and/or through an excavated tunnel.

PN - [US2008202119](#) A1 20080828

PR - US20080009127  
20080115; US20050073315  
20050304; US19970969712  
19971114; US19950545110  
19951019

AP - US20080009127 20080115

DT - \*\*

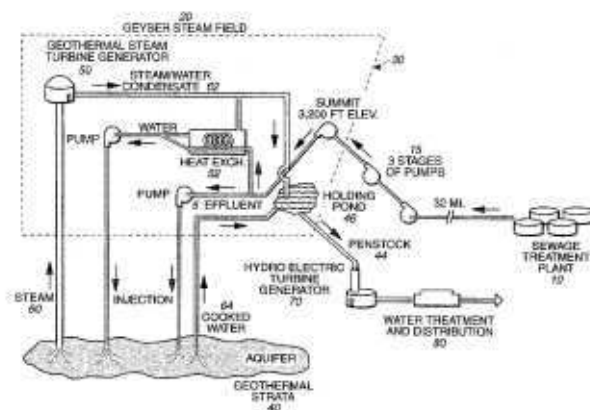
CT - || R141 (A1)  
[US5484231](#) A 19960116 [  
] (CANNAN WILLIAM L [US], et al);  
[US4077678](#) A 19780307 [  
] (STUDER PHILIP A, et al);  
[US4576006](#) A 19860318 [  
] (YAMAOKA KEIJIRO [JP]);  
[US3805885](#) A 19740423 [ ] (VAN  
HUISEN A);  
[US3950805](#) A 19760420 [  
] (MURPHY CHRISTOPHER J);  
[US4091623](#) A 19780530 [  
] (EDMONDSON JERRY M, et al);  
[US3454051](#) A 19690708 [  
] (GOEPFERT BENJAMIN L, et al);  
[US4948985](#) A 19900814 [  
] (ADAMS NELSON P [US]);  
[US4052858](#) A 19771011 [  
] (JEPPSON MORRIS R);  
[US5165235](#) A 19921124 [  
] (NITSCHKE GEORGE S [US])

CCI - [F03G7/04](#)

CCA - [Y02E10/10](#)

TI - Method of  
combining **wastewater**  
treatment and power generation  
technologies

AB - Applicant's preferred  
embodiment utilizes  
municipal **wastewater** effluent  
to replenish a depleted  
geothermal field. Condensate  
produced by expanding steam  
produced in the geothermal field  
through a steam **turbine-**  
**generator** may be pooled with  
cooked water collected from said  
field, and then directed through  
a penstock from a higher



elevation to a lower elevation where further energy is extracted through a traditional **hydroelectric turbine-generator**. The cooled water and condensate may be treated to produce potable water and/or distributed for public consumption either before or after being directed to the **hydroelectric turbine-generator**. The effluent is pumped up to the geothermal field during off-peak periods of electric consumption, and the **hydroelectric** generation is accomplished during periods of peak electric demand. A fraction of the effluent may be used as cooling water for the steam **turbine-generator** and its associated condenser before injection into the geothermal field. At least a portion of the pipeline to transport the **wastewater** effluent is preferably routed along an undisturbed riverbed and/or through an excavated tunnel.

10/10 © EPODOC / EPO

PN - [KR20020032457](#) A 20020503

PR - KR20020010451 20020227

AP - KR20020010451 20020227

DT - I

CNOI - [F03B13/00](#) ; [F03B17/02](#)

PA - KIM JU EON [KR]; PARK SOO JO [KR]

TI - SMALL **HYDROELECTRIC** POWER GENERATING APPARATUS USING **WASTEWATER** OF HIGH-RISE BUILDING

AB - PURPOSE: A small **hydroelectric** power generating apparatus is provided to recycle the **wastewater** to reduce the energy cost, and maximize the efficiency of the **hydroelectric** power energy using the **wastewater** from a high-rise building. CONSTITUTION: A small **hydroelectric** power generating apparatus has steel frame structures(7) including supporting plates(6). Water reservoirs(8) for storing the **wastewater** and generators(5) are installed at the supporting plates. **Wastewater** feeding pipes(2) having the connection hole and the generators(5) are connected to the rotation shaft of a water **turbine**. The water reservoirs(8) installed in the uppermost

supporting plates(6) of the steel frames are connected to a tank(1) on the roof through the drain pipes(10). The end of the feeding pipes(2) are connected to a septic tank. The power is transmitted from each **generator** (5) to a transformer substation(13) through an electricity wire(12).

[SS 19]