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(54) **WATER-SAVING DEVICE FOR GRADED USE OF WATER RESOURCES**

(57) Disclosed is a water-saving device for graded use of water resources. The water-saving device includes a sewage collection box, where a water input pipe is arranged on a top surface of the sewage collection box, a water pipe connector is arranged on the water input pipe, a connecting cavity is provided in the water pipe connector, and a fixing assembly is connected to the water pipe connector. A sewage treatment assembly is arranged in the sewage collection box, and a water output pipe is arranged on one side of the sewage collection box. According to the present invention, the water pipe connector is connected to a drainage pipe of domestic sewage, such that the domestic sewage enters the sewage collection box, qualified water is discharged from the water output pipe, and an application range of the water pipe connector is Widened.

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Dit octrooi is verleend ongeacht het bijgevoegde resultaat van het onderzoek naar de stand van de techniek en schriftelijke opinie. Het octrooischrift komt overeen met de oorspronkelijk ingediende stukken.

# WATER-SAVING DEVICE FOR GRADED USE OF WATER RESOURCES

## TECHNICAL FIELD

**[01]** The present invention relates to the technical field of water saving, and in particular to a water-saving device for graded use of water resources.

## BACKGROUND ART

**[02]** Water resources refer to water sources that can be used or may be utilized, and the water sources should have a sufficient number and appropriate quality, and satisfy demands of a certain place for specific utilization within a period of time. In current domestic sewage systems, for example, in domestic sewage links in facilities such as various office buildings, hotels, restaurants and residential houses, most water for flushing toilets and drinking still also uses the same level of water, which is a great waste for China with lack of water resources. For users, the expenditure burden of water fees and sewage charges is also increased.

**[03]** For graded use of water, the simplest, most convenient and fastest, and the lowest cost way is to start at a source of domestic sewage. Used water which is relatively clean in primary domestic sewage drainage, such as washing water is collected and treated nearby and is used in a relatively low water level in time, such as flushing a toilet. In the prior art, there are a lot of technologies about collecting primary domestic sewage for flushing toilets or other aspects. However, the technologies which are widely popularized and used in practical application are few, which causes a great waste of resources, such that water needs to be recycled, thereby achieving the purpose of saving water. In view of this, we put forward a water-saving device for graded use of water resources.

## SUMMARY

**[04]** An objective of the present invention is to provide a water-saving device for graded use of water resources so as to solve the problems mentioned in the background

art:

**[05]** To achieve the above objective, the present invention provides the technical solutions as follows:

**[06]** A water-saving device for graded use of water resources includes a sewage collection box, where a water input pipe is arranged on a top surface of the sewage collection box, a water pipe connector is arranged on the water input pipe, a connecting cavity is provided in the water pipe connector, the connecting cavity is of an inverted conical structure, and a fixing assembly is rotationally connected to an outer wall of the water pipe connector.

**[07]** A sewage treatment assembly is arranged in the sewage collection box, and a water output pipe is arranged on one side of the sewage collection box.

**[08]** Preferably, the sewage treatment assembly includes a filter screen, the filter screen is obliquely arranged, and a molecular sieve filter layer is arranged below the filter screen.

**[09]** Preferably, a scraper is arranged on a top surface of the filter screen, and a sliding block is connected to a side wall of the scraper. A sliding groove is provided in an inner wall of the sewage collection box, the sliding block moves along the sliding groove, a lead screw is arranged in the sliding groove, and the lead screw is in threaded connection to the sliding block. A driving motor is arranged on an outer wall of the sewage collection box, and an output shaft of the driving motor is connected to the lead screw.

**[10]** A waste outlet is provided on the side, located on the filter screen, of the sewage collection box, and a sealing plate is hinged to the waste outlet.

**[11]** Preferably, an outer wall of the water pipe connector is provided with a fixing plug ring in a sleeving manner, an outer wall of the fixing plug ring is of a conical structure, and a fixing assembly is mounted at a position below the fixing plug ring.

**[12]** Preferably, the fixing assembly includes connecting rods, end portions of the connecting rods are provided with connecting balls, and the connecting balls are rotationally connected to the outer wall of the water pipe connector. Outer end portions

of the connecting rods are connected to fixing plates, and two ends of the fixing plates are provided with first fixing members and second fixing members respectively.

**[13]** Preferably, the first fixing members include arc-shaped limiting blocks, outer sides of the arc-shaped limiting blocks are rotationally connected to adjusting screws, and the adjusting screws are in threaded connection to the fixing plates.

**[14]** Preferably, a plurality of limiting protrusions are arranged on an inner surface of each arc-shaped limiting block.

**[15]** Preferably, the second fixing members include ejector rods, and the ejector rods penetrate the fixing plates to be slidably connected to the fixing plates. The positions, located at inner sides of the fixing plates, of the ejector rods are provided with springs in a sleeving manner, cushion blocks are provided at inner end portions of the ejector rods, and the springs are connected to the cushion blocks.

**[16]** Preferably, threaded sections are arranged at the positions, located at outer sides of the fixing plates, of the ejector rods, connecting plates are connected to outer sides of the fixing plates, and the threaded sections are in threaded connection to the connecting plates.

**[17]** Compared with the prior art, the present invention has the beneficial effects as follows:

**[18]** According to the present invention, the water pipe connector is connected to a drainage pipe of domestic sewage, such that the domestic sewage enters the sewage collection box. The filter screen is configured to filter large impurities existing in the sewage, and the filter screen is obliquely arranged, such that the impurities may be concentrated at a lower end of the filter screen conveniently, the sewage may flow down conveniently, and the filter screen is prevented from being blocked. The molecular sieve filter layer is arranged below the filter screen, such that the molecular sieve filter layer may adsorb harmful substances such as pathogenic microorganisms and soluble solids contained in the sewage according to needs, calcium and magnesium ions in the sewage may be replaced to reduce hardness of the sewage, and finally the treated qualified water is discharged from the water output pipe. The water pipe

connector is provided with the connecting cavity, and the inner wall of the connecting cavity is provided with a layer of sealing gasket, such that connection sealing performance is improved. Moreover, the drainage pipes of different sizes may be conveniently connected by arranging the connecting cavity of the inverted conical structure. The fixing plug ring is arranged, such that when the drainage pipe of the domestic sewage is relatively thick and fails to be mounted in the connecting cavity, the drainage pipe of the domestic sewage may be arranged on the fixing plug ring in a sleeving manner, an application range of the water pipe connector is widened, and the water pipe connector may be applicable to the drainage pipes of different sizes for the domestic sewage. The fixing assembly is configured to fix the drainage pipe of the domestic sewage to the water pipe connector.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[19]** FIG. 1 is a schematic diagram of an integral structure of the present invention;

**[20]** FIG. 2 is a schematic diagram from a section view of a sewage collection box of the present invention;

**[21]** FIG. 3 is a schematic diagram from a section view of a water pipe connector of the present invention; and

**[22]** FIG. 4 is a schematic diagram of a connection structure between a sliding block, a scraper and a lead screw of the present invention.

**[23]** Reference numerals in the figures: 1, sewage collection box; 2, water input pipe; 3, water pipe connector; 301, connecting cavity; 4, fixing assembly; 401, connecting rod; 402, connecting ball; 403, fixing plate; 404, arc-shaped limiting block; 405, adjusting screw; 406, limiting protrusion; 407, ejector rod; 408, spring; 409, cushion block; 410, connecting plate; 5, sewage treatment assembly; 501, filter screen; 502, molecular sieve filter layer; 503, scraper; 504, sliding block; 505, lead screw; 506, driving motor; 6, water output pipe; 7, fixing plug ring; and 8, sealing plate.

## DETAILED DESCRIPTION OF THE EMBODIMENTS

**[24]** In the description of the present invention, it is to be understood that the terms "central", "longitudinal", "transverse", "length", "width", "thickness", "upper", "lower", "front", "back", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", "clockwise", "counterclockwise", etc. indicate azimuthal or positional relations based on those shown in the drawings only for ease of description of the present invention and for simplicity of description, and are not intended to indicate or imply that the referenced apparatus or element must have a particular orientation and be constructed and operative in a particular orientation, and thus may not be construed as a limitation on the present invention.

**[25]** In the description of the present invention, "plurality" means two or more, unless expressly specified otherwise.

**[26]** In the description of the present invention, it should be noted that, unless otherwise explicitly specified and defined, the terms "mounting", "providing", "sleeving/connecting", "connection", etc. should be understood in a broad sense, for example, "connection" may be a fixed connection, a detachable connection, or an integrated connection; may be a mechanical connection, or an electrical connection; and may be a direct connection, or an indirect connection via an intermediate medium, or communication inside two elements. For those of ordinary skill in the art, the specific meanings of the above terms in the present invention may be understood according to specific circumstances.

**[27]** Example:

**[28]** With reference FIGs. 1-4, a water-saving device for graded use of water resources includes a sewage collection box 1, where a water input pipe 2 is arranged on a top surface of the sewage collection box 1 and is configured to be connected to a drainage pipe of domestic sewage. A water pipe connector 3 is arranged on the water input pipe 2, and the water input pipe is connected to the drainage pipe of the domestic sewage by means of the water pipe connector 3, such that the domestic sewage enters the sewage collection box 1. A connecting cavity 301 is provided in the water pipe

connector 3, and an inner wall of the connecting cavity 301 is provided with a layer of sealing gasket, such that connection sealing performance is improved. The connecting cavity 301 is of an inverted conical structure, such that drainage pipes of different sizes may be conveniently connected by arranging the connecting cavity 301 of the inverted conical structure, and an application range of the water pipe connector 3 is widened. A fixing assembly 4 is rotationally connected to an outer wall of the water pipe connector 3, and the fixing assembly 4 is configured to fix the drainage pipe of the domestic sewage to the water pipe connector 3.

**[29]** A sewage treatment assembly 5 is arranged in the sewage collection box 1 and is configured to treat and purify the domestic sewage, and a water output pipe 6 is arranged on one side of the sewage collection box 1 and is configured to discharge the treated sewage.

**[30]** In the present invention, the sewage treatment assembly 5 includes a filter screen 501 which is configured to filter large impurities existing in the sewage. The filter screen 501 is obliquely arranged, such that the impurities may be concentrated at a lower end of the filter screen 501 conveniently, and the sewage may flow down conveniently. A molecular sieve filter layer 502 is arranged below the filter screen 501, such that the molecular sieve filter layer 502 may adsorb harmful substances such as pathogenic microorganisms and soluble solids contained in the sewage according to needs, calcium and magnesium ions in the sewage may be replaced to reduce hardness of the sewage, and finally the treated qualified water is discharged from the water output pipe 6.

**[31]** In the present invention, a scraper 503 is arranged on a top surface of the filter screen 501, and a sliding block 504 is connected to a side wall of the scraper 503. A sliding groove is provided in an inner wall of the sewage collection box 1, the sliding block 504 moves along the sliding groove, a lead screw 505 is arranged in the sliding groove, the lead screw 505 is rotationally connected to an inner wall of the sewage collection box 1, and the lead screw 505 is in threaded connection to the sliding block 504. A driving motor 506 is arranged on an outer wall of the sewage

collection box 1, an output shaft of the driving motor 506 is connected to the lead screw 505, and the driving motor 506 is configured to drive the lead screw 505 to rotate. As the lead screw 505 is in threaded connection to the sliding block 504, when the lead screw 505 rotates, the sliding block 504 will move along the lead screw 505, such that the scraper 503 is driven to move, and the impurities on a surface side of the filter screen 501 are scraped to a waste outlet to be discharged.

**[32]** The waste outlet is provided on the side, located on the filter screen 501, of the sewage collection box 1, and a sealing plate 8 is hinged to the waste outlet and configured to seal the waste outlet when waste is not discharged.

**[33]** In the present invention, the outer wall of the water pipe connector 3 is sleeved with a fixing plug ring 7, when the drainage pipe of the domestic sewage is relatively thick and fails to be mounted in the connecting cavity 301, the drainage pipe of the domestic sewage is arranged on the fixing plug ring 7 in a sleeving manner, an outer wall of the fixing plug ring 7 is of a conical structure, the fixing assembly 4 is mounted below the fixing plug ring 7, and the drainage pipe of the domestic sewage is fixed on the fixing plug ring 7 by using the fixing assembly 4.

**[34]** In the present invention, the fixing assembly 4 includes connecting rods 401, end portions of the connecting rods 401 are provided with connecting balls 402, and the connecting balls 402 are rotationally connected to an outer wall of the water pipe connector 3. Outer end portions of the connecting rods 401 are connected to fixing plates 403, two ends of the fixing plates 403 are provided with first fixing members and second fixing members respectively, and positions of the first fixing members and the second fixing members are conveniently converted by means of the arrangement of the connecting balls 402.

**[35]** The connecting rods 401 may also be configured as telescopic connecting rods, such that lengths of the connecting rods 401 may be conveniently adjusted according to a thickness of the drainage pipe.

**[36]** The first fixing members include arc-shaped limiting blocks 404, outer sides of the arc-shaped limiting blocks 404 are rotationally connected to adjusting screws

405, and the adjusting screws 405 are in threaded connection to the fixing plates 403. When the drainage pipe of the domestic sewage is mounted in the connecting cavity 301, the arc-shaped limiting blocks 404 are rotated to an outer side of the drainage pipe of the domestic sewage, and the arc-shaped limiting blocks 404 are pressed against an outer wall of the outer side of the drainage pipe of the domestic sewage by rotating the adjusting screws 405, such that the drainage pipe does not slip in the connecting cavity 301, thereby playing a role in fixing the drainage pipe and the water pipe connector 3.

**[37]** An inner surface of each arc-shaped limiting block 404 is provided with a plurality of limiting protrusions 406, friction force between the arc-shaped limiting blocks 404 and the drainage pipe is increased by arranging the limiting protrusions 406, and connection stability thereof is improved. Or the limiting protrusions may also be inserted into a groove in the outer wall of the drainage pipe, thereby increasing the connection stability.

**[38]** In the present invention, the second fixing members include ejector rods 407, and the ejector rods 407 penetrate the fixing plates 403 and are slidably connected to the fixing plates 403. The positions, located at inner sides of the fixing plates 403, of the ejector rods 407 are provided with springs 408 in a sleeving manner, cushion blocks 409 are provided at inner end portions of the ejector rods 407, and the springs 408 are connected to the cushion blocks 409. When the drainage pipe is arranged on the fixing plug ring 7 in a sleeving manner, the second fixing members are rotated upwards, and the ejector rods 407 move outwards, such that the cushion blocks 409 are pressed against or are inserted into the outer wall of the drainage pipe. In this case, the springs 408 are in a compressed state, and the drainage pipe is connected to the water pipe connector 3 by using elastic force of the springs 408.

**[39]** Threaded sections are arranged at the positions, located at outer sides of the fixing plates 403, of the ejector rods 407, connecting plates 410 are connected to outer sides of the fixing plates 403, and the threaded sections are in threaded connection to the connecting plates 410. The ejector rods 407 are limited by means of arrangement of the threaded sections and the connecting plates 410, thereby further improving the

connection stability of the drainage pipe.

**[40]** When the present invention is used, the water pipe connector 3 is connected to a drainage pipe of domestic sewage, such that the domestic sewage enters the sewage collection box 1. The filter screen 501 is configured to filter large impurities existing in the sewage, and the filter screen 501 is obliquely arranged, such that the impurities may be concentrated at a lower end of the filter screen 501 conveniently, the sewage may flow down conveniently, and the filter screen 501 is prevented from being blocked. The molecular sieve filter layer 502 is arranged below the filter screen 501, such that the molecular sieve filter layer 502 may adsorb harmful substances such as pathogenic microorganisms and soluble solids contained in the sewage according to needs, calcium and magnesium ions in the sewage may be replaced to reduce hardness of the sewage, and finally the treated qualified water is discharged from the water output pipe 6. The water pipe connector 3 is provided with the connecting cavity 301, and the inner wall of the connecting cavity 301 is provided with a layer of sealing gasket, such that connection sealing performance is improved. Moreover, the drainage pipes of different sizes may be conveniently connected by arranging the connecting cavity 301 of the inverted conical structure. The fixing plug ring 7 is arranged, such that when the drainage pipe of the domestic sewage is relatively thick and fails to be mounted in the connecting cavity 301, the drainage pipe of the domestic sewage may be arranged on the fixing plug ring 7 in a sleeving manner, an application range of the water pipe connector 3 is widened, and the water pipe connector may be applicable to the drainage pipes of different sizes for the domestic sewage. The fixing assembly 4 is configured to fix the drainage pipe of the domestic sewage to the water pipe connector 3. During use of the fixing assembly 4, when the drainage pipe of the domestic sewage is mounted in the connecting cavity 301, the arc-shaped limiting blocks 404 are pressed against the outer wall of the outer side of the drainage pipe of the domestic sewage by rotating the adjusting screws 405, such that the drainage pipe does not slip in the connecting cavity 301, thereby playing a role in fixing the drainage pipe and the water pipe connector 3. The limiting protrusions 406 are arranged on the inner sides of

the arc-shaped limiting blocks 404 to increase the friction force between the arc-shaped limiting blocks 404 and the drainage pipe, such that the connection stability thereof is improved. When the drainage pipe is arranged on the fixing plug ring 7 in a sleeving manner, the second fixing members are rotated upwards, and the ejector rods 407 move outwards, such that the cushion blocks 409 are pressed against or are inserted into the outer wall of the drainage pipe. In this case, the springs 408 are in the compressed state, and the drainage pipe is connected to the water pipe connector 3 by using the elastic force of the springs 408. The threaded sections are arranged at outer sides of the ejector rods 407 and are in threaded connection to the connecting plates 410, such that the ejector rods 407 are limited by means of arrangement of the threaded sections and the connecting plates 410, thereby further improving the connection stability of the drainage pipe.

**[41]** The above shows and describes the basic principles, essential features and advantages of the present invention. It should be understood by those skilled in the art that the present invention is not limited by the aforementioned examples. The aforementioned examples and the description are only the preferred examples of the present invention rather than limitations to the present invention without departing from the spirit and scope of the present invention. Such changes and modifications all fall within the claimed protection scope of the present invention. The claimed protection scope of the present invention is defined by the appended claims and their equivalents.

Conclusies

1. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen, die een afvalwaterverzamelbak (1) omvat, waarbij een watertoevoerleiding (2) gerangschikt is op een bovenoppervlak van de afvalwaterverzamelbak (1), een waterleidingaansluiting (3) gerangschikt is op de watertoevoerleiding (2), een aansluitholte (301) verschaft is in de waterleidingaansluiting (3), de aansluitholte (301) een omgekeerde conische structuur heeft, en een bevestigingssamenstel (4) roterend verbonden is met een buitenwand van de waterleidingaansluiting (3); en

waarbij een afvalwaterbehandelingssamenstel (5) in de afvalwaterverzamelbak (1) gerangschikt is en waterafvoerleiding (6) aan één zijde van de afvalwaterverzamelbak (1) gerangschikt is.

2. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen volgens conclusie 1, waarbij het afvalwaterbehandelingssamenstel (5) een filterscherm (501) omvat, waarbij het filterscherm (501) schuin gerangschikt is, en een moleculairezeeffilterlaag (502) gerangschikt is onder het filterscherm (501).

3. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen volgens conclusie 2, waarbij een schraper (503) gerangschikt is op een bovenoppervlak van het filterscherm (501), een schuifblok (504) verbonden is met een zijwand van de schraper (503), een schuifgroef verschaft is in een binnenwand van de afvalwaterverzamelbak (1), het schuifblok (504) langs de schuifgroef beweegt, een spindel (505) gerangschikt is in de schuifgroef, de spindel (505) in schroefdraadverbinding staat met het schuifblok (504), een aandrijfmotor (506) gerangschikt is op een buitenwand van de afvalwaterverzamelbak (1) en een uitgaande schacht van de aandrijfmotor (506) verbonden is met de spindel (505); en

waarbij een vuilafvoer verschaft is aan de zijkant, die zich op het filterscherm (501) bevindt, van de afvalwaterverzamelbak (1), en een afsluitplaat (8) scharnierend bevestigd is aan de vuilafvoer.

4. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen volgens conclusie 1, waarbij een buitenwand van de waterleidingaansluiting (3)

voorzien is van een bevestigingsplugring (7) op een omwikkelende wijze, een buitenwand van de bevestigingsplugring (7) van een conische structuur is, en een bevestigingssamenstel (4) gemonteerd is op een positie onder de bevestigingsplugring (7).

5. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen volgens conclusie 1, waarbij het bevestigingssamenstel (4) verbindingsstangen (401) omvat, eindgedeelten van de verbindingsstangen (401) voorzien zijn van verbindingskogels (402), de verbindingskogels (402) roterend verbonden zijn met de buitenwand van de waterleidingaansluiting (3), buitenste eindgedeelten van de verbindingsstangen (401) verbonden zijn met bevestigingsplaten (403), en twee uiteinden van de bevestigingsplaten (403) voorzien zijn van respectievelijk eerste bevestigingselementen en tweede bevestigingselementen.

6. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen volgens conclusie 5, waarbij de eerste bevestigingselementen boogvormige begrenzingsblokken (404) omvatten, buitenzijden van de boogvormige begrenzingsblokken (404) roteerbaar verbonden zijn met regelschroeven (405), en de regelschroeven (405) in schroefdraadverbinding staan met de bevestigingsplaten (403).

7. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen volgens conclusie 6, waarbij een veelheid van begrenzingsuitsteeksels (406) gerangschikt zijn op een binnenoppervlak van elk van de boogvormige begrenzingsblokken (404).

8. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen volgens conclusie 5, waarbij de tweede bevestigingselementen uitwerpstangen (407) omvatten, de uitwerpstangen (407) de bevestigingsplaten (403) binnendringen om verschuifbaar verbonden te worden met de bevestigingsplaten (403), de posities, die zich aan de binnenzijden van de bevestigingsplaten (403) bevinden, van de uitwerpstangen (407) voorzien zijn van veren (408) op een omwikkelende wijze, kussenblokken (409) verschaft zijn aan de binnenste eindgedeelten van de uitwerpstangen (407), en de veren (408) verbonden zijn met de kussenblokken (409).

9. Waterbesparende inrichting voor geleidelijk gebruik van waterhulpbronnen volgens conclusie 8, waarbij schroefdraadsecties gerangschikt zijn op de posities, die zich aan de buitenzijden van de bevestigingsplaten (403) bevinden, van de uitwerpstangen (407), waarbij verbindingsplaten (410) verbonden zijn met de buitenzijden van de bevestigingsplaten (403), en de schroefdraadsecties in schroefdraadverbinding zijn met de verbindingsplaten (410).

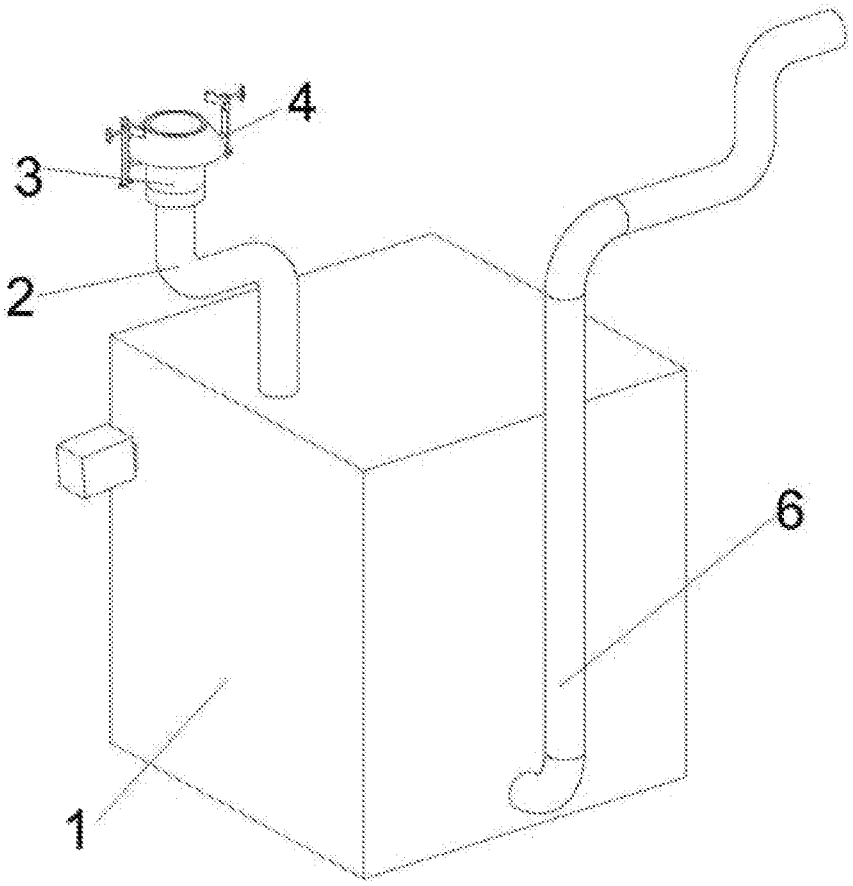



**FIG. 1**

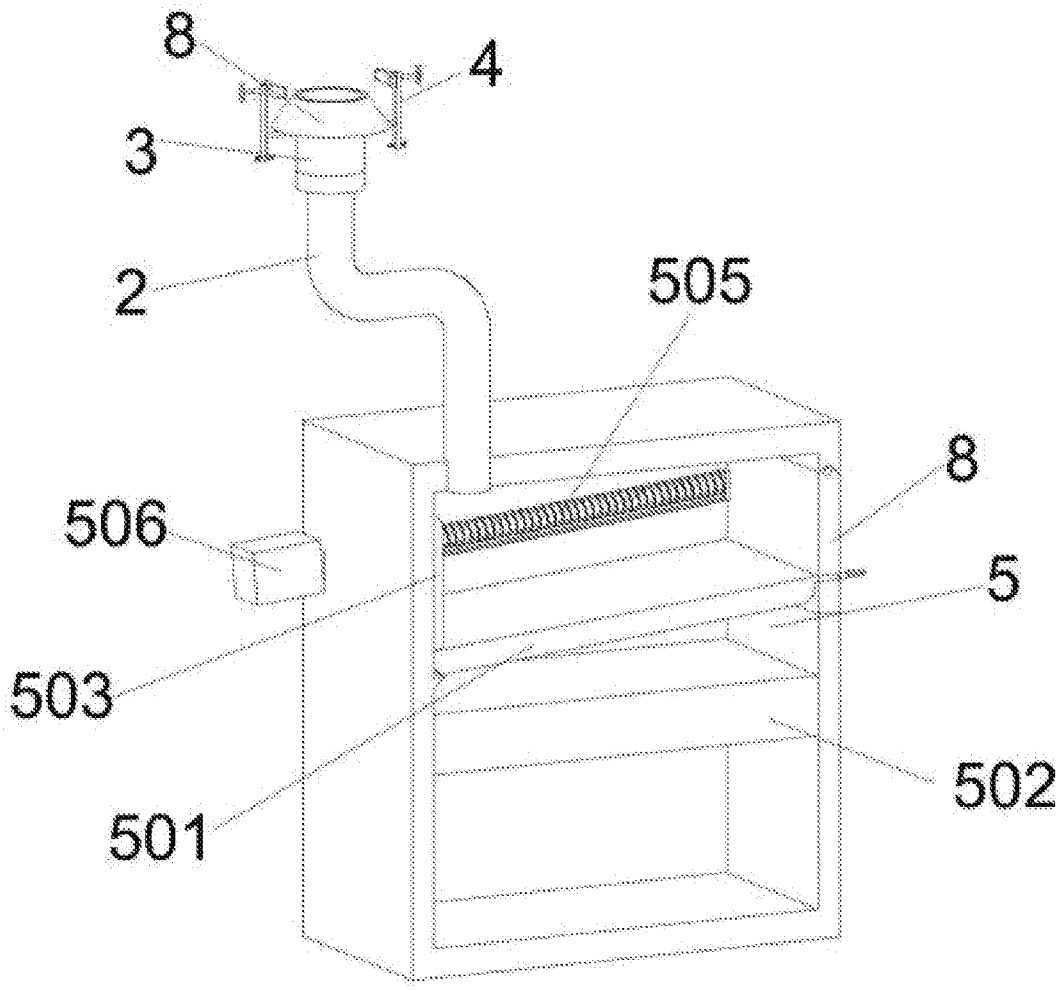



**FIG. 2**

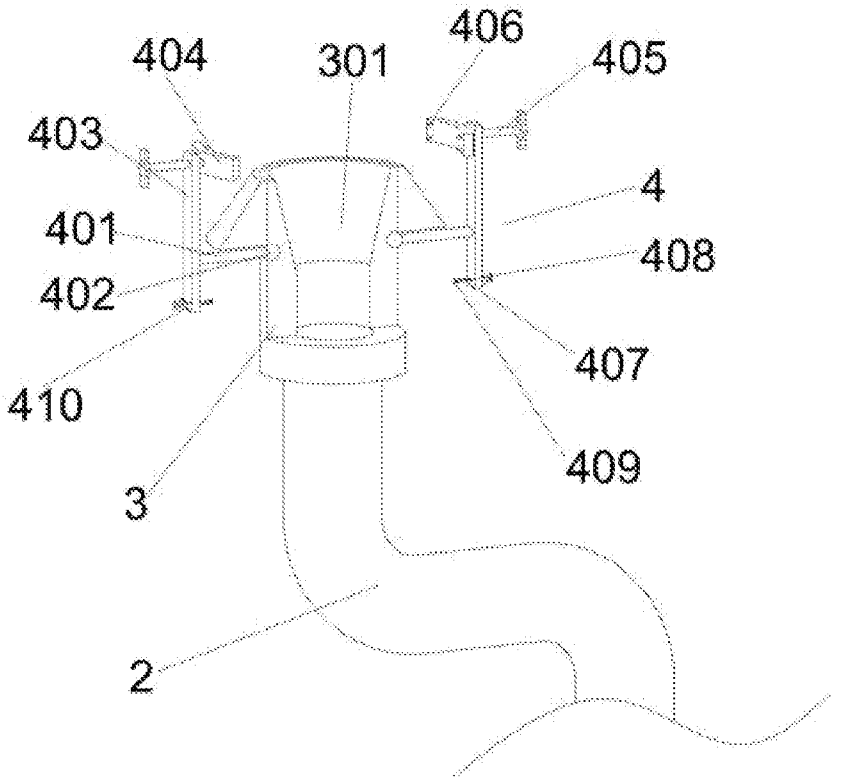



FIG. 3

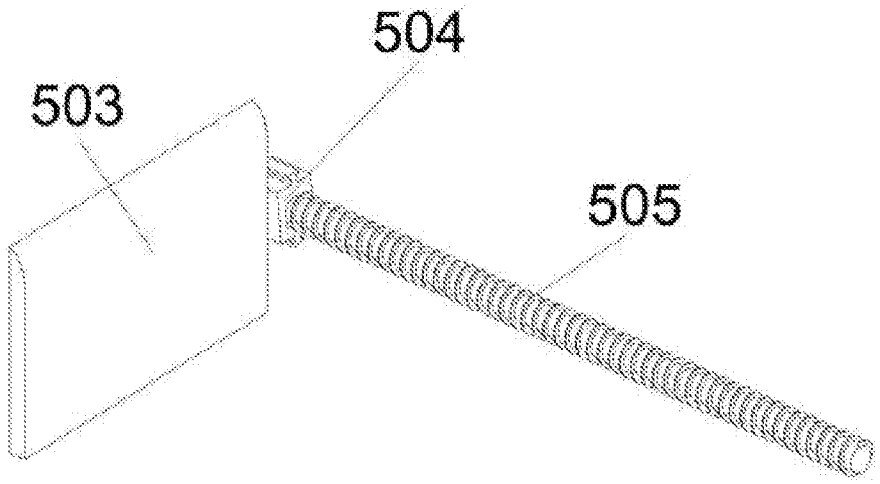



FIG. 4

Rijksdienst voor Ondernemend Nederland

OCTROOIAANVRAAG NR.:
NO 142868
NL 2034492

# ONDERZOEKSRAPPORT

BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK

## RELEVANTE LITERATUUR

| Categorie[1] | Literatuur met, voor zover nodig, aanduiding van speciaal van belang zijnde tekstgedeelten of figuren. | Van belang voor conclusie(s) nr: | Classificatie(IPC) |
|---|---|---|---|
| | EENHEID VAN UITVINDING ONTBREEKT<br>zie aanvullingsblad B | | INV.<br>C02F1/00<br>C02F1/28 |
| X | CN 213 141 679 U (LI XIAOXUAN)<br>7 mei 2021 (2021-05-07)<br>* figuur 1 *<br>* alinea [0001] *<br>* alinea [0021] * | 1-3 | ADD.<br>C02F103/00 |
| X | CN 110 937 703 A (LIU LING)<br>31 maart 2020 (2020-03-31)<br>* figuur 1 * | 1-3 | |
| A | CN 214 936 490 U (JILIN ZHUJIE ENVIRONMENTAL PROT CO LTD)<br>30 november 2021 (2021-11-30)<br>* figuur 1 * | 1-3 | |
| A | CN 109 019 916 A (ZHANGJIAGANG FREE TRADE ZONE KANGHUA TRADING CO LTD)<br>18 december 2018 (2018-12-18)<br>* figuur 1 * | 1-3 | Onderzochte gebieden van de techniek<br>C02F |

Indien gewijzigde conclusies zijn ingediend, heeft dit rapport betrekking op de conclusies ingediend op:

| Plaats van onderzoek: | Datum waarop het onderzoek werd voltooid: | Bevoegd ambtenaar: |
|---|---|---|
| 's-Gravenhage | 11 juli 2023 | Janssens, Christophe |

[1] NDERLINCATEGORIE VAN DE VERMELDE LITERATUUR

X: de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur
Y: de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht
A: niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft
O: niet-schriftelijke stand van de techniek
P: tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur
T: na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvrage, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding
E: eerdere octrooi(aanvrage), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven
D: in de octrooiaanvrage vermeld
L: om andere redenen vermelde literatuur
&: lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie



EOB FORM 02.83 (P0414B)

# GEBREK AAN EENHEID VAN UITVINDING

Octrooiaanvrage Nr.:
NO 142868
NL 2034492

## AANVULLINGSBLAD B

De Instantie belast met het uitvoeren van het onderzoek naar de stand van de techniek heeft vastgesteld dat deze aanvrage meerdere uitvindingen bevat, te weten:

1. conclusies: 1-3

   A device for treating sewage water

   ---

2. conclusie: 4

   A device for coupling sewage pipes of different diameter

   ---

3. conclusies: 5-9

   A device for fixing two sewage pipes that are coupled with each other

   ---

Het vooronderzoek werd tot het eerste onderwerp beperkt.

# AANHANGSEL BEHORENDE BIJ HET RAPPORT BETREFFENDE HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK, UITGEVOERD IN DE OCTROOIAANVRAGE NR.

NO 142868
NL 2034492

Het aanhangsel bevat een opgave van elders gepubliceerde octrooiaanvragen of octrooien (zogenaamde leden van dezelfde octrooifamilie), die overeenkomen met octrooischriften genoemd in het rapport.
De opgave is samengesteld aan de hand van gegevens uit het computerbestand van het Europees Octrooibureau per
De juistheid en volledigheid van deze opgave wordt noch door het Europees Octrooibureau, noch door het Bureau voor de Industriële eigendom gegarandeerd;; de gegevens worden verstrekt voor informatiedoeleinden.

11-07-2023

| In het rapport genoemd octrooigeschrift | Datum van publicatie | Overeenkomend(e) geschrift(en) | Datum van publicatie |
|---|---|---|---|
| CN 213141679 U | 07-05-2021 | GEEN | |
| CN 110937703 A | 31-03-2020 | GEEN | |
| CN 214936490 U | 30-11-2021 | GEEN | |
| CN 109019916 A | 18-12-2018 | GEEN | |



Algemene informatie over dit aanhangsel is gepubliceerd in de 'Official Journal' van het Europees Octrooibureau nr 12/82 blz 448 ev

# SCHRIFTELIJKE OPINIE

| DOSSIER NUMMER | INDIENINGSDATUM | VOORRANGSDATUM | AANVRAAGNUMMER |
|---|---|---|---|
| NO142868 | 03.04.2023 | 27.07.2022 | NL2034492 |

CLASSIFICATIE
INV. C02F1/00 C02F1/28 ADD. C02F103/00

AANVRAGER
Institute of Water Resources for Pastoral Area, MWR

Deze schriftelijke opinie bevat een toelichting op de volgende onderdelen:

- ☒ Onderdeel I Basis van de schriftelijke opinie
- ☐ Onderdeel II Voorrang
- ☒ Onderdeel III Vaststelling nieuwheid, inventiviteit en industriële toepasbaarheid niet mogelijk
- ☒ Onderdeel IV De aanvraag heeft betrekking op meer dan één uitvinding
- ☒ Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid
- ☐ Onderdeel VI Andere geciteerde documenten
- ☐ Onderdeel VII Overige gebreken
- ☒ Onderdeel VIII Overige opmerkingen

DE BEVOEGDE AMBTENAAR
Janssens, Christophe

Aanvraag nr.:

# SCHRIFTELIJKE OPINIE

NL2034492

## Onderdeel I Basis van de Schriftelijke Opinie

1. Deze schriftelijke opinie is opgesteld op basis van de meest recente conclusies ingediend voor aanvang van het onderzoek.

2. Deze motivering is opgesteld, met betrekking tot **nucleotide- en/of aminozuursequenties** die genoemd worden in de aanvraag, op basis van een sequentielijst die:

   a. ☐ is opgenomen in de aanvraag zoals deze oorspronkelijk is ingediend

   b. ☐ aangeleverd is na de indieningsdatum ten behoeve van het onderzoek

      ☐ en vergezeld ging van een verklaring dat de sequentielijst niet meer informatie bevat dan de aanvraag zoals deze oorspronkelijk is ingediend.

3. ☐ Deze motivering is opgesteld, met betrekking tot nucleotide- en/of aminozuursequenties die genoemd worden in de aanvraag, voor zover een zinvolle motivering gevormd kon worden zonder een sequentielijst die voldeed aan WIPO standaard ST.26.

4. Overige opmerkingen:

## Onderdeel III Vaststelling nieuwheid, inventiviteit en industriële toepasbaarheid niet mogelijk

De vraag of de uitvinding in de aanvraag nieuw, inventief en industrieel toepasbaar is, wordt niet behandeld in deze schriftelijke opinie met betrekking tot:

☐ de gehele aanvraag

☒ conclusies 4-9

omdat:

☐ deze aanvraag of deze conclusies , betrekking hebben op materie waarvoor het niet zinvol is een schriftelijke opinie op te stellen.

☐ de beschrijving, figuren of deze conclusies , , zo onduidelijk zijn dat het niet zinvol is een schriftelijke opinie op te stellen.

☐ deze conclusies , onvoldoende steun vinden in de beschrijving waardoor het niet zinvol is een schriftelijke opinie op te stellen.

☒ geen onderzoek naar de stand van de techniek is uitgevoerd voor deze conclusies 4-9.

☐ een zinvolle motivering kon niet worden gevormd zonder de sequentielijst; de aanvrager heeft geen sequentielijst die voldeed aan WIPO standaard ST.26 ingediend.

☐ Zie aparte bladzijde

Aanvraag nr.:

# SCHRIFTELIJKE OPINIE

NL2034492

## Onderdeel IV De aanvraag heeft betrekking op meer dan één uitvinding

1. Vastgesteld is dat de octrooiaanvraag betrekking heeft op meer dan één uitvinding.

   **Zie aparte bladzijde**

2. Het onderzoek naar de stand van de techniek is beperkt tot de eerstgenoemde uitvinding in de conclusies en betreft:

   ☐ alle conclusies

   ☒ conclusies: (zie nieuwheidsrapport)

## Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid

1. Verklaring

| | | |
|---|---|---|
| Nieuwheid | Ja: | Conclusies 2, 3 |
| | Nee: | Conclusies 1 |
| Inventiviteit | Ja: | Conclusies |
| | Nee: | Conclusies 1-3 |
| Industriële toepasbaarheid | Ja: | Conclusies 1-3 |
| | Nee: | Conclusies |

2. Citaties en toelichting:

   **Zie aparte bladzijde**

## Onderdeel VIII Overige opmerkingen

De volgende opmerkingen met betrekking tot de duidelijkheid van de conclusies, beschrijving, en figuren, of met betrekking tot de vraag of de conclusies nawerkbaar zijn, worden gemaakt:

**Zie aparte bladzijde**

**Item VIII**

**Certain observations on the application**

1 The present application does not meet the requirements of patentability, because the subject-matter of claim 1 is not clearly defined.

1.1 Claim 1 intends to define a water saving device for the graduated use of water resources. The different parts of the physical entity are however not capable of reducing the use of water. The sewage collection box 1 is a location to temporarly store water. The water input pipe 2 and the water output pipe 6 are means to transport water from one location to another. The water pipe connector 3 and the water assembly 4 are means to ensure a good connection between a sewage effluent pipe and the water input pipe 2 of the device. The sewage treatment assembly is a means to treat incoming sewage water. Other parts of the device not mentioned in independent claim 1 but mentioned in the description and the dependent claims also do not appear to be able to reduce the water consumption or to help in providing a graduated use of water resources. The fixing plug 7 is a further means to ensure a good connection between a sewage effluent pipe and the water input pipe 2 of the device. The sealing plate 8 is a means for blocking a waste outlet. Thus, none of the parts can actually reduce the consumption of water or adapt the consumption of water according to specified needs. The description appears to describe a device for treating water, more specifically for making domestic effluents suitable for reuse in domestic environments, rather than a water saving device for the graduated use of water resources.

1.2 Claim 1 misses essential features. The expression "sewage treatment assembly" used in claim 1 is very vague. Water treatment can be understood in a very broad way. In its broadest sense it even may comprise storing water in a container and flowing water through a conduit. The description however suggests that the treatment includes an active removal of at least one contaminant from a sewage stream. The intended scope of protection of claim 1 is therefore not clear. It is also not clear where the water outlet pipe 6 is located with respect to the sewage treatment assembly. A sewage collection box has many sides and may, according to the definition of claim 1 currently on file, thus also be located on the same side as the water input pipe. Such a

device would of course not be suitable for producing a treated water. This problem is also present if the features of dependent claim 2 would be added to independent claim 1.

1.3 The expression "rotationally connected to the outer wall of the pipe connector" used in claim 1 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear.

1.4 The device defined by claim 1 also does not contain all the features necessary for providing the beneficial effects mentioned in the paragraphs 17 and 18 of the description of the application. To be able to have these beneficial effects, the device would need to have at least the following features:

- a filter screen configured to filter out large impurities (large is however a relative term and has no well recognized meaning within the field of water treatment), the filter screen being obliquely arranged (otherwise the the impurities will not concentrate at a lower end and the screen will get blocked);

- a waste outlet on the side near the lowest point of the oblique filter screen with a sealing plate hinged thereto (without the outlet the impurities will accumulate above the filter screen and eventually block the filter screen, without the sealing plate the majority of the incoming water will go to the waste outlet without passing the filter screen, because this would be the way of the least resistance);

- a molecular sieve filter layer arranged downstream of the filter screen (without the layer harmful substances such as pathogens and soluble solids such as scale inducing cations will not be removed, making the treated water unsuitable for reuse);

- a treated water outlet downstream of the molecular sieve filter layer (otherwise untreated water will be delivered); and

- a adaptable structure which can ensure a water tight connection between a drainage pipe and the water input pipe irrespective of the diameters of the drainage pipe and the water input pipe.

These features are however not found in claim 1 currently on file.

1.5 As can be understood from the above discussion, claim 1 is defining an entity with relatively few features. In the way claim 1 is currently drafted, it defines in its broadest sense:

> A physical entity comprising
>
> a container suitable for holding sewage water with an inlet conduit and an outlet conduit,
>
> whereby the inlet conduit is located on the top of the container,
>
> whereby the inlet conduit has a water pipe connector connected thereto, the water pipe connector comprising
>
> - a connecting cavity having an inverted conical structure and
>
> - an assembly for fixing a sewage pipe to the inlet conduit.

## Item IV

## Lack of unity of invention

2 The present application does not meet the requirement of unity.

2.1 Unity of invention has first to be evaluated on the independent claims. There is only one independent claim, claim 1, however the subject-matter of this claim is not new (see novelty discussion below). It has therefore to be evaluated if the claims dependent on claim 1 are linked by a single new and inventive concept.

2.2 There are three claims that directly depend on claim 1, namely the claims 2, 4 and 5. As the subject-matter of claim 1 is not new, the features of claim 1 cannot be considered as a single, new and inventive concept linking the these three claims.

2.3 The features of these claims 2, 4 and 5 are not similar or corresponding. The additional features of the dependent claims 2, 4 and 5 solve different technical problems. The features of claim 2 provide further details on the way of treating the water. The features of claim 4 makes it possible that drainage pipes of different sizes may be connected to the water input pipe. The features of claim

5 ensure that the drainage pipe and the water input pipe do not move with resect to each other. A common concept underlying the claims 2, 4 and 5 could therefore also not be found.

2.4 The claims 2, 4 and 5 are therefore not linked so as to form a single general inventive concept.

2.5 The present application is therefore split up into the following groups:

Group I (claims 1, 2-3): A device for treating sewage water;

Group II (claims 4): A device for coupling sewage pipes of different diameter;

Group III (claims 5-9): A device for fixing two sewage pipes that are coupled with each other.

2.6 The present report is therefore restricted to the first invention mentioned i.e. the above mentioned Group I.

**Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

3 Furthermore, the above-mentioned lack of clarity notwithstanding, the subject-matter of claim 1 is not new, and the criteria of patentability are therefore not met.

3.1 Reference is made to the following documents:

D1 CN 213 141 679 U (LI XIAOXUAN) 7 mei 2021 (2021-05-07)

D2 CN 110 937 703 A (LIU LING) 31 maart 2020 (2020-03-31)

D3 CN 214 936 490 U (JILIN ZHUJIE ENVIRONMENTAL PROT CO LTD) 30 november 2021 (2021-11-30)

D4 CN 109 019 916 A (ZHANGJIAGANG FREE TRADE ZONE KANGHUA TRADING CO LTD) 18 december 2018 (2018-12-18)

3.2 The document D1 discloses (see in particular fig.1):

A physical entity comprising

a container (8) suitable for holding sewage water (§1: domestic sewage) with an inlet conduit (9) and an outlet conduit,

whereby the inlet conduit (9) is located on the top of the container (8),

whereby the inlet conduit (9) has a water pipe connector connected thereto, the water pipe connector comprising

- a connecting cavity (interior of inlet conduit 9) having an inverted conical structure (lower part of inlet conduit 9) and

- an assembly for fixing a sewage pipe to the inlet conduit (implicit: domestic sewage water smells, anyone would therefore foresee an odour tight connection between the source of the sewage water and the inlet).

3.3 The document D1 therefore discloses a device having all the features of the device defined by claim 1. the subject-matter of claim 1 is therefore not new.

3.4 Several other documents disclose the subject-matter of claim 1 (see for example D2, fig.1).

4 The additional features of the dependent claims do not appear to be able to render the subject-matter of claim 1 novel and inventive.

4.1 Claims 2 and 3: The document D1 explicitly discloses a filter screen (see fig. 3, ref. 15), which is cleaned by means of a block with on its lower side a scraper (16). The scraper is moved by a motor (17) which is turning a lead screw (18). Waste collected on the screen is pushed towards an opening in the side wall of the box (8) , the opening being covered by a rotatable baffle (19). Waste can be collected in a collection box (20). The screen is not inclined, however it is obvious that materials tend to assemble under the influence of gravity, anyone

would therefore incline the screen to enhance the collection of material retained by the screen. The installation of a molecular sieve layer downstream of a grid is common practice n domestic sewage treatment (see for example D2, layer 6 and D3, fig.1, layers 195, 196, 197, D4, layer 15).

5 Additional remarks

5.1 Figure 2 contains an error. The reference sign 8 is mentioned twice: once at the top of the device near the fixing assembly 4 and once on the right side in the middle near the sewage assembly 5. It is understood from the description that the reference sign at the top was intended to refer to the fixing plug ring 7 and the reference sign on the right side to the sealing plate 8.