



(12) Utility model patent

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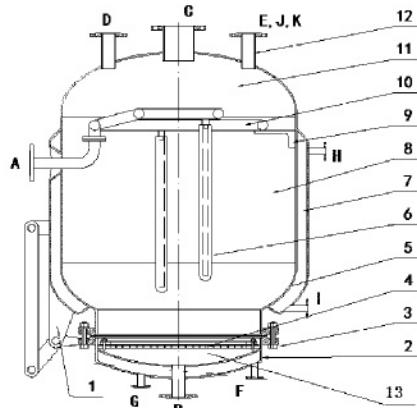
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(54) Name of utility model

Filter washing and drying device

(57) Abstract

The filter washing and drying device comprises a kettle body composed of an inner cylinder, an upper head and a lower head, the lower head is provided with a detachable filter assembly, the kettle body is fixed with a filter core rod distributor, the filter core rod distributor is provided with at least one filter core rod; The upper head is provided with a plurality of material inlet allowing materials to enter the kettle body, the material inlet contains at least one compressed gas inlet; The simple body of the kettle body is provided with a first external interface connecting the filter core rod with the outside world, and the lower head is provided with a second external interface connecting the filter plate assembly. The utility model has the advantages that the filtration, washing and drying operations can be completed respectively in the same device, the unit operation is simplified, the energy consumption is saved, the solvent consumption and material loss are reduced, the pollution is reduced and the investment is reduced, and the utility model is suitable for the occasions containing toxic, flammable and explosive solvents.



1, the filter washing and drying device is characterized in that: comprises an inner cylinder, an upper head and a lower head composed of the kettle body, the lower head is provided with a detachable filter assembly, the kettle body is fixed with a filter core rod distributor, the filter core rod distributor is provided with at least one filter core rod;

The upper head is provided with a plurality of material inlet allowing the material to enter the kettle body, the material inlet contains at least one compressed gas inlet;

The simple body of the kettle body is provided with a first external interface connecting the filter core rod with the outside world, and the lower head is provided with a second external interface connecting the filter plate assembly.

2. As the filter washing and drying device described in claim 1, the filter washing and drying device is characterized in that the material inlet also includes the agitator inlet allowing the stirring device to enter the kettle body.

3, such as the filter washing and drying device described in claim 1 or 2, which is characterized by: the inner cylinder of the kettle body is provided with a first heating jacket, the outer side of the lower head is provided with a second heating jacket, the heating jacket is provided with a heat exchange medium, the heating jacket is provided with a medium entrance and a medium outlet.

4. Such as the filter washing and drying device described in claim 3, its characteristics are: the filter plate assembly is connected with the lower head through the flange, the kettle body and the lower head is provided with a quick-opening cover device, the lower head and the quick-opening cover device hinged, the quick-opening cover device is fixed on the kettle body; The lower head is connected with the autoclave body through the connecting bolt.

5. The filter washing and drying device described in claim 4 is characterized in that the filter plate assembly comprises a grille plate firmly connected with the lower head, the grille plate is covered with a screen and a filter cloth, the screen is close to the grille plate, The filter cloth completely covers the screen, the filter cloth is provided with a ring press plate on the edge of the filter cloth, the ring press plate through the bolt and the grid plate solid connection.

6, such as the filter washing and drying device described in claim 5, which is characterized by: the filter core rod distributor comprises an outer arc ring and an inner arc ring, and a connection rod connecting two arc rings; The outer circle ring and the inner circle ring are concentrically arranged, and the circle ring is evenly distributed on the interface connecting the filter core rod.

Filter washing and drying device

Technical field

[0001] The utility model relates to a filter washing and drying device.

Background technology

[0002] Filtration as a mature solid-liquid separation technology, is widely used in food, chemical, medicine and many other fields, refined production process, usually need to filter the material, washing, filtration cycle operation, and finally the washing filter after the material heating and drying treatment, filtration, washing and drying is usually completed in the corresponding filter and dryer, the material needs to be asked in different devices Transmission, cumbersome operation, energy consumption, solvent and material loss, equipment investment is large.

Content of invention

[0003] In order to overcome the shortcomings of the prior art, the utility model can respectively complete the filtration, washing and drying operations in the same device, simplify the unit operation, save energy consumption, reduce solvent consumption and material loss, reduce pollution and reduce investment, and is suitable for the filtration washing and drying device containing toxic, flammable and explosive solvents.

[0004] The filter washing and drying device comprises a kettle body composed of an inner cylinder, an upper head and a lower head, the lower head is provided with a detachable filter component, the kettle body is fixed with a filter core rod distributor, the filter core rod distributor is provided with at least one filter core rod;

[0005] the upper head is provided with a plurality of material inlet allowing materials to enter the kettle body, the material inlet comprises at least one compressed air inlet;

[0006] the barrel body of the kettle body is provided with a first external interface connecting the filter core rod with the outside world, and the lower head is provided with a second external interface connecting the filter plate assembly.

[0007] Further, the material inlet also includes an agitator inlet allowing a stirring device to enter the interior of the kettle body.

[0008] Further, the inner body of the kettle body is provided with a first heating jacket, the outer side of the lower head is provided with a second heating jacket, the heating jacket is provided with a heat exchange medium, and the heating jacket is provided with a medium inlet and a medium outlet.

[0009] Further, the filter plate assembly is connected with the lower head through the flange, the kettle body and the lower head is provided with a quick-opening cover device, the lower head and the quick-opening cover device is hinged, the quick-opening cover device is fixed on the kettle body; The lower head is connected with the kettle body through the connecting bolt.

[0010] Further, the filter plate assembly comprises a grid plate firmly connected with the lower head, the grid plate is covered with a screen and a filter cloth, the screen is closely attached to the grid plate, the filter cloth is completely covered with the screen, the filter cloth is provided with a ring press plate on the edge of the filter cloth, the ring press plate is firmly connected with the grid plate through the bolt.

[0011] Further, the filter core bar distributor comprises an outer arc ring and an inner arc ring, as well as a connection rod connecting two arc rings; The outer arc ring and the inner arc ring are concentrically arranged, and the arc ring is evenly distributed with a jack inserted into the filter core rod.

[0012] The technical idea of the utility model is that the solid-liquid mixed material that needs to be filtered is added to the kettle, and the compressed gas is pressed into the compressed gas inlet of the upper cover to begin filtering. In the initial stage of filtering, the kettle has a higher liquid level, and the first external interface is opened to make the filter core rod communicate with the outside world, and the second external interface is opened to make the filter plate assembly communicate with the outside world, and the filter core rod and the filter plate assembly are simultaneously connected. The filtrate will continue to be filtered out through the filtration operation; With the filtrate filtered out, the liquid level in the kettle drops, and the filter core rod will gradually expose the liquid level. At this time, the first external interface can be closed, and the filter plate assembly can continue to filter until the filtration

Finished. After the completion of one filtration, the pressure inside the kettle can be drained and the washing liquid can be injected into the washing operation. Using the agitator inlet on the upper part of the kettle body, a portable mixing device can be inserted for washing and stirring to improve the washing efficiency. After the completion of washing, it can be filtered again according to the above-mentioned filtration operation. Filtration and operation can be repeated until the process requirements are met.

[0013] After the washing and filtration operation is completed, the heating medium is passed into the first heating jacket and the second heating jacket for heating and drying treatment. Finally, the filter plate assembly is disassembled and discharged to obtain the finished material of filtration washing and drying. The filter plate assembly is fixed on the lower head of the kettle body with a large size flange connection. The quick-opening cover device set between the kettle body and the filter plate assembly can be easily opened to facilitate discharging or replacing the filter core rod and filter cloth inside the kettle body.

[0014] The utility model has the advantages of completing filtration, washing and drying operations respectively in the same device, simplifying unit operation, saving energy consumption, reducing solvent consumption and material loss, reducing pollution and reducing investment, and is suitable for the occasions containing toxic, inflammable and explosive solvents.

Illustration with drawings

[0015] 图1本实用新型示意图,过滤板组件未拆卸开。

[0016] 图2本实用新型示意图,过滤板组件局部放大图。

[0017] 图3本实用新型示意图,滤芯棒分布器。

[0018] 图4本实用新型示意图,滤芯棒分布器的侧视图。

[0019] 图5本实用新型示意图,过滤板组件已拆卸开。

Specific implementation method

[0020] Referring to the attached drawing, the utility model is further explained:

[0021] The filter washing and drying device comprises a kettle body 8 composed of an inner simple 5, an upper head 11 and a lower head 13, the lower head 13 is provided with a detachable filter assembly 4, the kettle body 8 is fixed with a filter core rod distributor 10, the filter core rod distributor 10 is provided with at least one filter core rod 6;

[0022] the upper head 11 is provided with a plurality of material inlet D, C.E, J, K allowing materials to enter the kettle body, the material inlet comprises at least one compressed air inlet D;

[0023] the barrel body of the kettle body 8 is provided with A first external interface A connecting the filter core rod 6 with the outside world, and the lower head 13 is provided with a second external interface B connecting the filter plate assembly 4

[0024] The material inlet also comprises an agitator inlet C allowing the agitator device to enter the interior of the kettle body

[0025] the inner cylinder body of the kettle body 8 is provided with a first heating jacket 7, the outer side of the lower head 13 is provided with a second heating jacket 2, heating jacket 7, 2 is provided with a heat exchange medium, heating jacket 7, 2 is provided with a medium inlet I, G and medium outlet H.F.

[0026] the filter plate assembly 4 is connected with the lower head 13 through the flange, the kettle body 8 and the lower head 13 is provided with a quick-opening cover device 1, the lower head 13 is hinged with the quick-opening cover device 1, the quick-opening cover device 1 is fixed on the kettle body 8, the lower head 13 is connected with the kettle body 8 through the connection bolt 3.

[0027] The filter plate assembly 4 comprises a grating plate 41 firmly connected with the lower head 13, the grating plate 41 is covered with a screen 42 and a filter cloth 43, the screen 42 is closely attached to the grating plate 41, the filter cloth 43 is completely covered with the screen 42, the filter cloth 43 is provided with a ring press plate 44 on the edge of the filter cloth 43, the ring press plate 44 is solidly connected with the bolt.

[0028] The filter core bar distributor 10 comprises an outer arc ring 101 and an inner arc ring 102, and connects two arc rings

Connecting rod 103 of 101 and 102; The outer circular arc ring 101 and the inner circular arc ring 102 are concentrically arranged, and the circular arc ring 101 and 102 are uniformly distributed with a jack 104 inserted with a filter core rod 6.

[0029] The technical idea of the utility model is that the solid-liquid mixed material that needs to be filtered is added to the kettle, and the compressed air is pressed into the compressed air through the compressed air inlet of the upper cover. In the initial stage of filtration, the kettle has a higher liquid level, and the first external interface is opened to make the filter core rod communicate with the outside world, and the second external interface is opened to make the filter plate assembly communicate with the outside world, and the filter core rod and the filter plate assembly are simultaneously connected. The filtrate will continue to be filtered out through the filtration operation; With the filtrate filtered out, the liquid level in the kettle drops, and the filter core rod will gradually expose the liquid level. At this time, the first external interface can be closed, and the filter plate assembly can continue to filter until the filtration is completed. After the completion of a filtration, the pressure in the kettle can be drained, and the washing liquid can be injected into the washing operation. The portable stirring device can be inserted into the agitator inlet at the upper part of the kettle body for washing and stirring to improve the washing efficiency. After the completion of washing, it can be filtered again according to the above-mentioned filtration operation. Filtration and operation can be repeated until the process requirements are met.

[0030] After the washing and filtration operation is completed, the heating medium is passed into the first heating jacket and the second heating jacket for heating and drying treatment. Finally, the filter plate assembly is disassembled and discharged to obtain the filter washing and drying finished materials. The filter plate assembly is fixed on the lower head of the kettle body with a large size flange connection. The quick-opening cover device set between the kettle body and the filter plate assembly can be easily opened to facilitate discharge or replacement of the filter core rod and filter cloth inside the kettle body.

[0031] The utility model has the advantages of completing filtration, washing and drying operations respectively in the same device, simplifying unit operation, saving energy consumption, reducing solvent consumption and material loss, reducing pollution and reducing investment, and is suitable for the occasions containing toxic, inflammable and explosive solvents.

[0032] The contents of the embodiments of the specification are only an enumeration of the realization form of the idea of the utility model. The scope of protection of the utility model shall not be regarded as limited to the specific form stated in the embodiment. The scope of protection of the utility model also covers the equivalent technical means that the technical personnel in the field can think of according to the idea of the utility model.

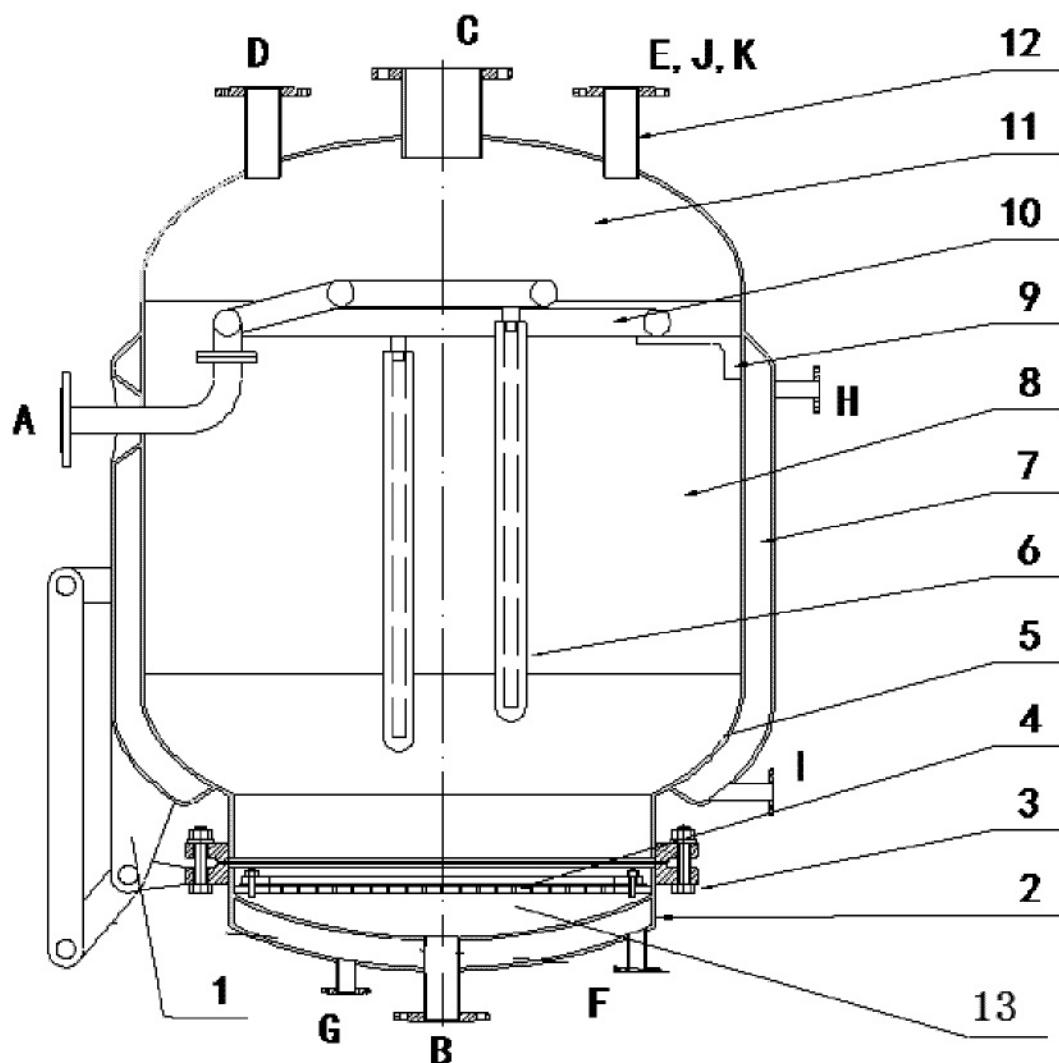


FIG. 1

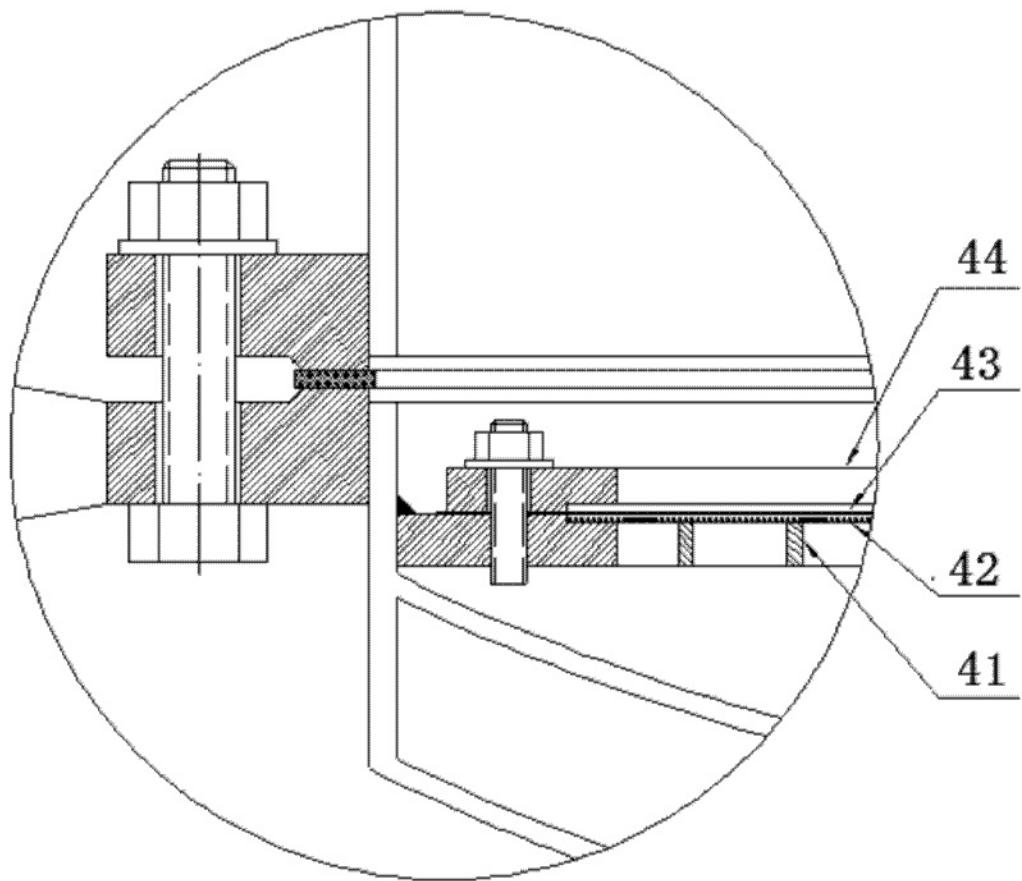


Figure 2

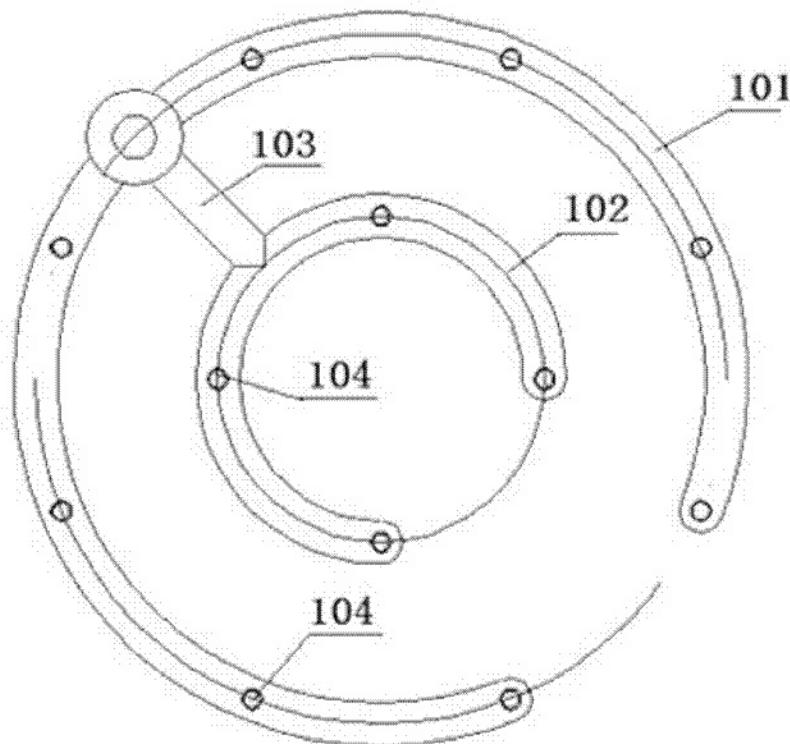


Figure 3

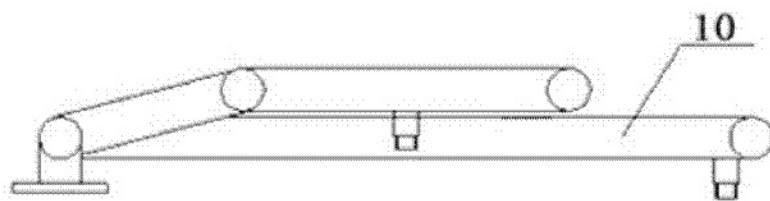


Figure 4

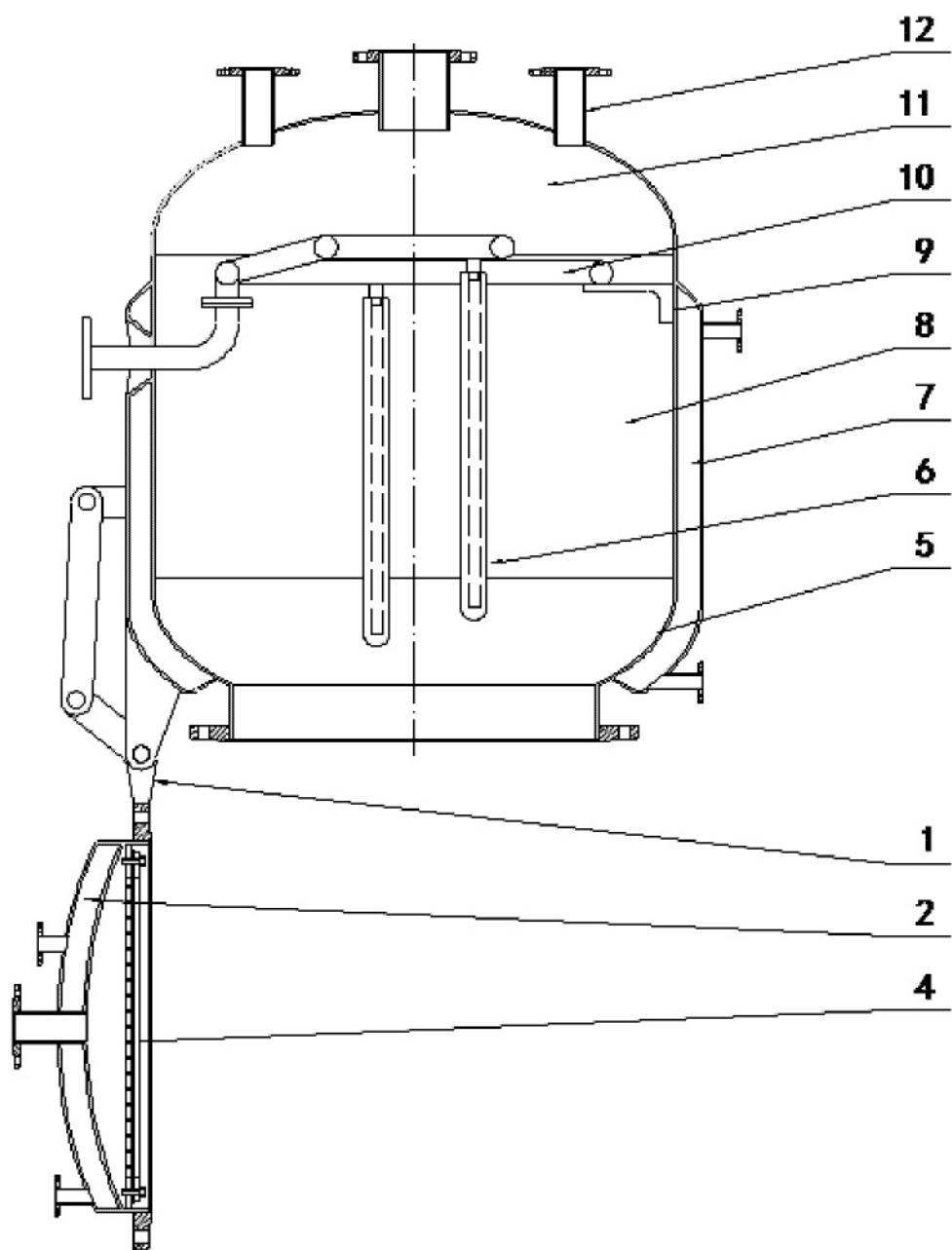


图5



(12) Utility model patent

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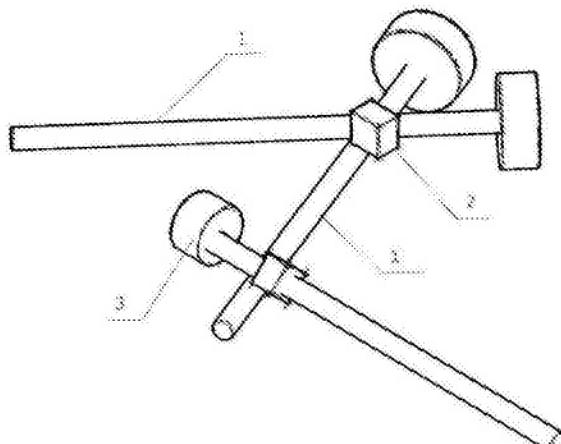
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(54) Name of utility model

An accurate fixing device for off-field welded pipe device

(57) Abstract

The utility model discloses an accurate fixing device for an off-field welding pipe device, which comprises a modeling base plate, a first wire rod, a second wire rod, a third wire rod, a universal rotating joint and an inner wire quick mounting joint; The four corners of the upper face of the modeling bottom plate are provided with a mounting hole for installing the first wire rod, one end of the first wire rod is installed in the mounting hole, the first wire rod and the second wire rod are provided with a universal adapter, the universal adapter head is provided with the first interface connecting the first and second wire rod through the first interface and the second interface connecting with the first and second wire rod. The second wire rod and the third wire rod are arranged on the first interface. The utility model is transferred to the non-explosion-proof and suitable for hot area for pipe welding by adjusting the alignment of the device, so as to achieve the purpose of no need to stop production and clear the site to transfer combustible materials and waste production time, and ensure the welding quality.



1. An accurate fixing device for an off-field welded pipe device, characterized by including a modeling base plate, a first wire rod, a second wire rod, a third wire rod, a universal adapter and an internal wire quick fitting joint, wherein the first wire rod, the second wire rod and the third wire rod utilize the universal adapter to fix different fasteners;

The modeling bottom plate top surface of the four corners are provided for the installation of the first wire rod installation hole, one end of the first wire rod is installed in the installation hole, the first wire rod and the second wire rod is arranged on the universal adapter, the universal adapter head has a connection of the first, the second wire rod through the first interface and with the said The first and second wire rod are connected with the second interface, and the second wire rod and the third wire rod are pierced on the first interface.

2. As described in claim 1, an accurate fixing device for an off-field welding pipe device is characterized in that the end of the first wire rod, the second wire rod and the third wire rod are provided with an internal wire quick opening or flange plate to split the remote modeling parts.

- Kind of off-field connection E precise E device

Technical field

[0001] The utility model belongs to the flammable and explosive technical field, in particular to the off-site welding and on-site assembly of pipe fittings and flanges in flammable and explosive areas, narrow and crowded welding areas, an accurate fixing device for off-site welding pipe devices.

Background technology

[0002] In fireproof and explosion-proof places (such as fine chemical industry, liquefied petroleum gas, metal processing, etc.) and narrow crowded areas, due to corrosion, process changes or other reasons, it is necessary to replace and change the pipeline. At this time, it is often necessary to transfer materials, clean the site, remove pipes and blind plates to achieve hot working conditions on site.

[0003] However, the ensuing human and material resources, energy and time loss is very large, and there may also be unknown risks. The on-site mold taking and off-site modeling device can effectively reduce risks, improve production efficiency, and flexibly change pipes. In addition, the welder resources are scarce, and the device is operated by ordinary personnel to build the mold in different places, which can improve the welding efficiency; Narrow crowded area welding is difficult to take into account the whole, off-site can also improve the quality of welding

Content of invention

[0004] In order to solve the above technical problems existing in the prior art, the utility model provides a safe and efficient accurate fixing device for off-site welding pipe devices, which is suitable for pipe replacement and tube modification due to corrosion, process change or other reasons in fireproof and explosion-proof places (such as fine chemical industry, liquefied petroleum gas, metal processing, etc.) and narrow crowded areas.

[0005] The technical scheme adopted by the utility model is:

[0006] An accurate fixing device for an off-field welding pipe device, which is characterized in that it comprises a modeling base plate, a first wire rod, a second wire rod, a third wire rod, a universal joint and an internal wire quick assembly joint. The first wire rod, the second wire rod and the third wire rod use the universal joint to fix different fasteners;

[0007] The four corners of the upper face of the modeling bottom plate are provided with a mounting hole for installing the first wire rod, one end of the first wire rod is installed in the mounting hole, the first wire rod and the second wire rod are arranged on the universal adapter, the universal adapter head is connected with the first and second wire rod through the first interface and the first First, the second wire rod connection of the second interface, the second wire rod and the third wire rod through the first interface.

[0008] Further, the end of the first wire rod, the second wire rod and the third wire rod are provided with an inner wire quick opening or flange plate to split the off-site modeling parts.

[0009] Compared with the prior art, the beneficial effect of the utility model is mainly embodied in that the utility model is suitable for replacing and changing pipes due to corrosion, process change or other reasons in fireproof and explosion-proof places (such as fine chemical industry, liquefied petroleum gas, metal processing, etc.) and narrow crowded areas.

Illustration with drawings

[0010] 图1为本实用新型的易地建模件;

[0011] 图2为本实用新型现场取模件;

[0012] 图3为本实用新型建模底座结构示意图;

[0013] Figure 4 is the structure diagram of the metal wire rod of the utility model;

[0014] FIG. 5 is the utility model universal adapter structure diagram;

[0015] FIG. 6a is the schematic diagram of the inner wire quick opening structure of the utility model;

[0016] FIG. 6b is the structure diagram of the flange plate of the utility model.

Implementation mode

[0017] The specific embodiments of the utility model are described in detail in combination with the attached drawings. It should be understood that the specific embodiments described herein are only used to illustrate and explain the embodiments of the utility model and are not used to limit the embodiments of the utility model.

[0018] It should be noted that the embodiments of the utility model and the features in the embodiments may be combined with each other, provided that there is no conflict.

[0019] The utility model is described in detail by reference to the attached drawings and combined with exemplary embodiments.

[0020] Referring to FIG. 1 to FIG. 6b, the utility model relates to an accurate fixing device for an off-field welded pipe device, which comprises a modeling base plate 1, a first wire rod (connecting the bottom plate)2, a second wire rod (connecting the inner wire quick opening joint)3, a third wire rod (auxiliary connection)4, a universal adapter 5 and an inner wire quick mounting joint 6, wherein the first wire rod 2, the second wire rod 3, and the second wire rod 3 The three wire rod 4 uses the universal adapter 5 to fix different fasteners to form an easy modeling device in Figure 1.

[0021] The fourth wire rod (as the main rod for field modeling, used for connecting other wire rods in series)7, the fifth wire rod (fixed with the quick opening interface of the field, and through the universal adapter and the fourth wire rod 7 fixed to form the field mold taking device in Figure 2

[0022] FIG. 50,000 full picture of the universal adapter. The 13 holes in the metal block 11 are used to insert the metal rod, and the fixing bolt 12 is used to fix the metal rod that has been inserted into the metal block 11. The bolt 16 can be inserted in the middle of the metal round ball 15, and the two sides are fixed with the inner round lug 14, and the bolt 16 is finally inserted, and the lower side is tightened with the hanging nut.

[0023] The modeling bottom plate 1 is provided with a mounting hole for installing the first wire rod 2 at four corners of the upper face, one end of the first wire rod 2 is installed in the mounting hole, the first wire rod 2 and the second wire rod 3 are arranged on the universal adapter, the universal adapter 5 is connected with the first and second wire rod through the first The interface and the second interface connected with the first and second wire rod, the second wire rod and the third wire rod through the first interface.

[0024] In one embodiment, the end of the first wire rod, the second wire rod and the third wire rod are provided with an inner wire quick-opening 6 or a flange plate for the disassembly of the off-site modeling accessory.

[0025] The metal wire rod of the utility model is not long enough and can be docked and lengthened with each other.

[0026] The utility model takes advantage of Figure 1 and Figure 2, through on-site mold taking, off-site modeling, off-site welding, and finally takes the module to the site installation.

[0027] 1. Taking the mold on the spot, the metal wire rod is used to tighten the inner wire quick opening (the inner thread pipe has been welded in the center, and there are screw holes on four sides) and the spot quick opening tightening or flange tightening. The wire rod is connected with the main rod of the wire rod through the universal swivel, and the universal swivel is fixed and tightened. The wire rod is not long enough, and it can be lengthened by docking with each other. Finally, remove the quick opening or flange plate of the connection site in Figure 2 and take out the assembly.

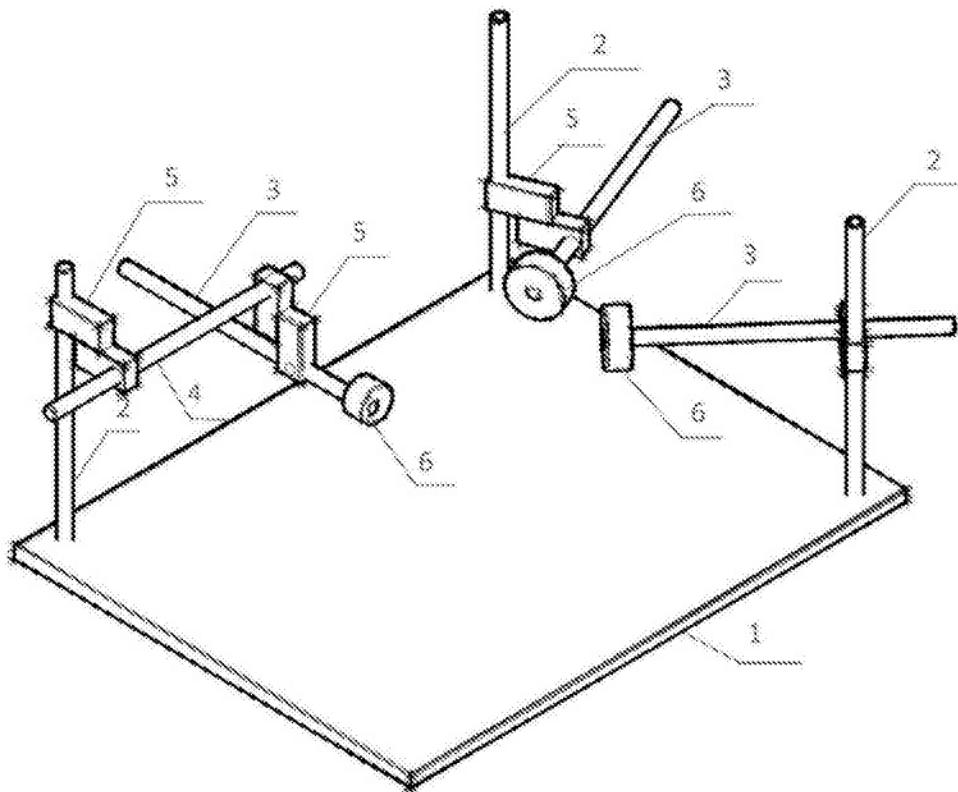
[0028] 2. Modeling easily. After taking out Figure 2, move it to the modeling base, rely on the modeling base to build wire rod, universal adapter and inner wire quick fitting joint or inner wire flange plate, and fix Figure 2 to the modeling with screws or quick opening buckle in the reverse.

[0029] 3. Field comparison and reconfirmation. Take Figure 2 back to the site to confirm that the assembly has no deformation and the Angle is correct.

[0030] 4. The inner wire quick opening or flange plate in FIG. 1 should be fitted with quick opening and flange plate of the same specification respectively, and fixed properly.

[0031] 5. Look for the welder on the spot to see the position and roughly suitable for piping, and do the final welding on Figure 1.

[0032] Although embodiments of the utility model have been shown and described above, it can be understood that the embodiments are exemplary and cannot be understood as limitations of the utility model, and that the embodiments can be changed, modified, replaced and modified by ordinary technicians in the field within the scope of the utility model.



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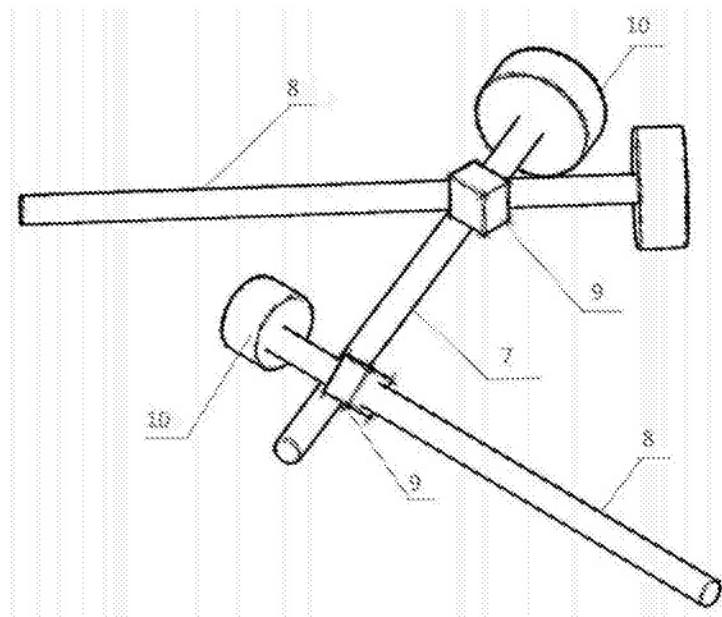


图2



图3



图4

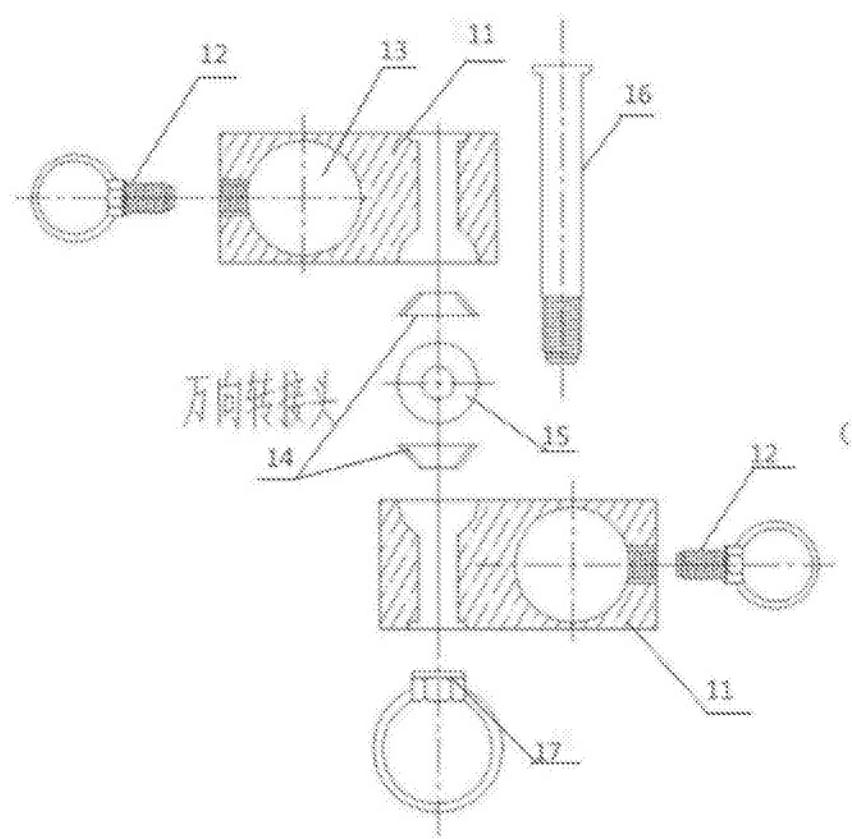


FIG. 5

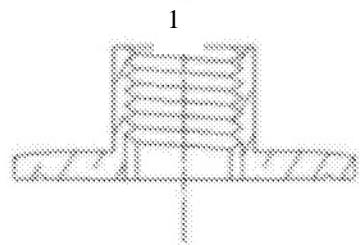


Figure 6

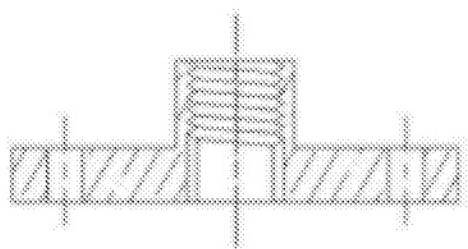


Figure 6b



(12) Utility model patent

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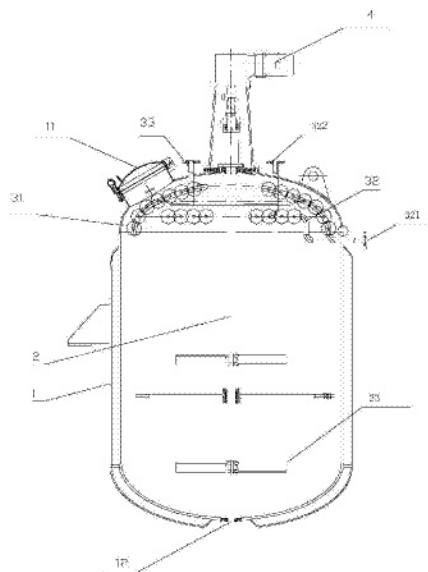
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(54) Name of utility model

Applicable to reactors containing sublimated materials

(57) Abstract

The utility model discloses a reaction kettle suitable for containing sublimated materials, including a kettle body and a stirring shaft arranged in the kettle body, the kettle body is provided with a reaction chamber for materials to react, the kettle body is provided with a feed port and a discharge port communicated with the reaction chamber, The reaction chamber of the reactor body is provided with a sublimation material recovery device, the sublimation material recovery device comprises a number of fins, coils and sprays, the fins are arranged on the top of the reaction chamber, the fins are connected through the coil; The coil has interworking medium inlet and medium outlet, medium inlet, medium outlet is located outside the kettle body, medium inlet is connected with cold source or heat source; The spray is arranged on the top of the kettle body, the liquid inlet of the spray is communicated with the reaction liquid, and the spray mouth of the spray is aligned with the fin. The utility model has the advantages of simple structure, low cost and easy access, effective collection of materials at the top of the reaction kettle, and improvement of yield and utilization rate of raw materials.



1. The reactor is suitable for a reaction kettle containing sublimation material, including a kettle body (1) and a stirring shaft (2) arranged in the kettle body (1), the kettle body (1) is provided with a reaction chamber for material to react, the kettle body (1) is provided with a feed port (11) and a discharge port (12) communicated with the reaction chamber. The reactor body (1) is characterized in that the reaction chamber is provided with a sublimation material recovery device (3), the sublimation material recovery device (3) includes a number of fins (31), coil (32) and spray device (33), the fin (31) is arranged on the top of the reaction chamber, the fin (31) through the coil (32) connected; The coil (32) has an interworking first medium connecting port (321) and the second medium connecting port (322). The first medium connecting port (321) and the second medium connecting port (322) extend to the kettle body (1), and the first medium connecting port (321) and the second medium connecting port (322) are respectively connected with a cold source or heat source; The spray nozzle (33) is arranged on the top of the kettle body (1), the liquid inlet of the spray nozzle (33) is connected with the reaction liquid, and the spray nozzle of the spray nozzle (33) is aligned with the fin (31).

2. As described in claim 1, a reaction kettle containing sublimated materials is characterized in that the top of the kettle body (1) is provided with a power mechanism (4), and the driving shaft of the power mechanism (4) is connected with the top of the stirring shaft (2).

- Suitable for a reaction kettle containing sublimed materials

Technical field

[0001] The utility model relates to a reaction kettle which is suitable for containing sublimed materials, belonging to the field of chemical equipment.

Background technology

[0002] In the actual production of chemical industry, some reaction raw materials in the reaction process, there will be sublimation phenomenon in the condensation at the top of the reaction kettle, the part of the material can not participate in the reaction, resulting in the reaction material ratio is unstable, the reaction speed is slow, increase energy consumption, increase production costs; To the end of the synthetic reaction, want to collect the excess unreacted raw materials, but it is easy to cause pipeline blockage leading to recovery failure, and easy to sublimate materials long-term gathered in the top of the reactor, distillation pipeline and condenser cleaning recycling process is extremely difficult, while due to long-term accumulation, there are security risks, the process appears more, affecting production capacity, so avoid this kind of situation Now and as far as possible to collect the material to apply to the later batch is an urgent problem to be solved.

Utility model content

[0003] In order to solve the above problems, the utility model provides a reaction kettle which is suitable for containing sublimed materials. The reactor can collect sublimed materials and return sublimed materials to the system to participate in the reaction, avoid the waste of sublimed materials and solve the problem of reducing the reaction speed, and the unreacted raw materials can be collected and recycled as far as possible after the reaction is over, and the cost can be reduced.

[0004] The technical scheme adopted by the utility model to solve the technical problem is:

[0005] The invention relates to a reaction kettle which is suitable for a sublimation material, including a kettle body and a stirring shaft arranged in the kettle body, the kettle body is provided with a reaction chamber for the material to react, the kettle body is provided with a feed port and an outlet port communicated with the reaction chamber, which is characterized in that the reaction chamber of the kettle body is provided with a sublimation material recovery device, the sublimation material recovery device comprises a number of fins and coils And spray device, the fin is arranged on the top of the reaction chamber, the fin is connected through the coil; The coil has interworking of the first medium connecting port and the second medium connecting port, the first medium connecting port, the second medium connecting port are extended to the kettle body outside, and the first medium connecting port, the second medium connecting port is connected to the cold source or heat source; The spray nozzle is arranged on the top of the kettle body, the liquid inlet of the spray nozzle is connected with the reaction liquid, and the spray nozzle of the spray nozzle is aligned with the fin.

[0006] Further, the top of the kettle body is provided with a power mechanism, and the driving shaft of the power mechanism is connected with the top of the stirring shaft.

[0007] When used, the coil passes into the cooling or heating medium according to the actual situation. In normal production, through the cooling medium will sublime to the reaction chamber above the material condensed to the fin, to collect more materials, and then into the coil tube into the heating medium, and the appropriate use of spray on the fin, the material collected on the fin to the reactor body of the reaction chamber reaction system to participate in the reaction. At the end of the reaction, the cooling medium is passed into the coil tube, and the unreacted material can be collected again into the fin, which will be applied when the next batch of material reacts.

[0008] The utility model has the following advantages:

[0009] (1) The utility model has the advantages of simple structure, complete function, easy production and low cost.

[0010] (2) The sublimed materials can be cleaned up in time and returned to the system to participate in the reaction, avoiding the waste of sublimed materials and the problem of slow reaction speed, eliminating hidden dangers.

[0011] (3) It can collect the unreacted materials at the end of the reaction in time and apply them when the next batch of materials react

Save raw materials.

Illustration with picture

[0012] Figure 1 is a structure diagram of the utility model.

Specific implementation mode

[0013] The specific embodiments of the utility model are described in detail in combination with the attached drawings. It should be understood that the specific embodiments described herein are only used to illustrate and explain the embodiments of the utility model and are not used to limit the embodiments of the utility model.

[0014] It should be noted that the embodiments of the utility model and the features in the embodiments can be combined with each other, provided that there is no conflict.

[0015] In the description of the utility model, the need to understand is that the term "the center", "vertical", "horizontal", "length", "width" and "thickness", "on" and "down", "before" and "after", "left", "right" and "vertical", "level", "top", "bottom" "within" and "outside", "clockwise" and "rotate", "axis", "radial" The azimuth or position relationship indicated by, "circumference", etc., is based on the azimuth or position relationship shown in the attached figure, only to facilitate the description of the utility model and simplify the description, but not to indicate or imply that the device or element referred to must have a specific orientation, construction and operation in a specific orientation, so it cannot be understood as a limitation of the utility model.

[0016] In addition, the terms "first" and "second" are used for descriptive purposes only and cannot be understood as indicating or hinting at relative importance or implicitly indicating the quantity of the indicated technical features. Thus, a feature qualified as "first" or "second" may explicitly or implicitly include at least one of those features. In the description of the utility model, the meaning of "multiple" is at least two, such as two, three, etc., unless otherwise expressly and specifically defined.

[0017] In the utility model, unless otherwise clearly specified and limited, the terms "installation", "connection", "connection", "fixed" and other terms shall be broadly understood, for example, can be fixed connection, can also be detachable connection, or into one; Can be mechanical connection, can also be electrical connection or can communicate with each other; It can be directly connected, or indirectly connected through an intermediate medium, and it can be a connection within two components or an interaction between two components, unless otherwise expressly defined. For ordinary technical personnel in the field, the specific meaning of the above terms in the utility model can be understood according to the specific circumstances.

[0018] In the utility model, unless otherwise expressly specified and limited, the first feature "above" or "below" the second feature may be the first and second features in direct contact, or the first and second features in indirect contact through an intermediate medium. Moreover, the first feature is "above", "above" and "above" the second feature, but the first feature is directly above the second feature or diagonally above the second feature, or merely indicates that the first feature is higher than the second feature. The first feature being "below", "below", and "below" the second feature can mean that the first feature is directly or diagonally below the second feature, or simply that the first feature is less horizontal than the second feature.

[0019] In the description of this specification, the description of the reference terms "an embodiment", "some embodiments", "examples", "specific examples", or "some examples", etc., means that the specific features, structures, materials, or features described in conjunction with the embodiment or example are contained in at least one embodiment or example of the utility model. In this specification, the schematic expression of the above terms must not be directed to the same embodiment or example. Furthermore, the specific features, structures, materials or features described may be combined in an appropriate manner in any one or more embodiments or examples. In addition, without contradicting each other, persons skilled in the art may combine and combine the different embodiments or examples described in this specification and the features of different embodiments or examples.

[0020] The utility model is described in detail below by reference to the attached drawings and in conjunction with exemplary embodiments.

[0021] The invention relates to a reaction kettle containing sublimated materials, comprising a kettle body 1 and a stirring shaft 2 arranged in the kettle body 1, the kettle body 1 is provided with a reaction chamber for the material to react, the kettle body 1 is provided with a feed port 11 communicated with the reaction chamber, the discharge port 12, the reaction chamber of the kettle body 1 is provided with a sublimation material recovery device 3, the sublimation material recovery device 3 comprises if Dry fin 31, coil 32 and spray 33, the fin 31 is set on the top of the reaction chamber, the fin 31 through the coil 32 connection, wherein the shape of the fin, gap, material, etc. can be changed according to the characteristics of different sublimed substances; The coil 32 has interworking of the first medium connecting port 321 and the second medium connecting port 322, the first medium connecting port 321, the second medium connecting port 322 extended to the kettle body 1 outside, the first medium connecting port 321, the second medium connecting port 322 connected to the cold source or heat source, according to the difference in the medium, the inlet and outlet can be rooted According to the need to transform; The spray 33 is arranged on the top of the kettle body 1, the liquid inlet of the spray 33 is communicated with the reaction liquid, and the spray mouth of the spray 33 is aligned with the fin 310

[0022] In some embodiments of the utility model, the top of the kettle body 1 is provided with a power mechanism 4, and the driving shaft of the power mechanism 4 is connected with the top of the stirring shaft 2. The power mechanism may be an electric motor.

[0023] In some embodiments of the utility model, the lower part of the stirring shaft 2 is provided with a stirring paddle 23.

[0024] When used, the coil tube passes into the cooling or heating medium according to the actual situation. In normal production, through the cooling medium will sublime to the reaction chamber above the material condensation to the fin, to collect more materials, and then into the coil through the heating medium, and the appropriate use of spray to spray the fin, the material collected on the fin to the reactor body of the reaction chamber reaction system to participate in the reaction. At the end of the reaction, the cooling medium is passed into the coil tube, and the unreacted material can be collected again into the fin, which will be applied when the next batch of material reacts.

[0025] Although embodiments of the utility model have been shown and described above, it is understood that the embodiments are exemplary and cannot be construed as limitations of the utility model, and that the embodiments may be changed, modified, replaced or modified by ordinary technicians in the field within the scope of the utility model.

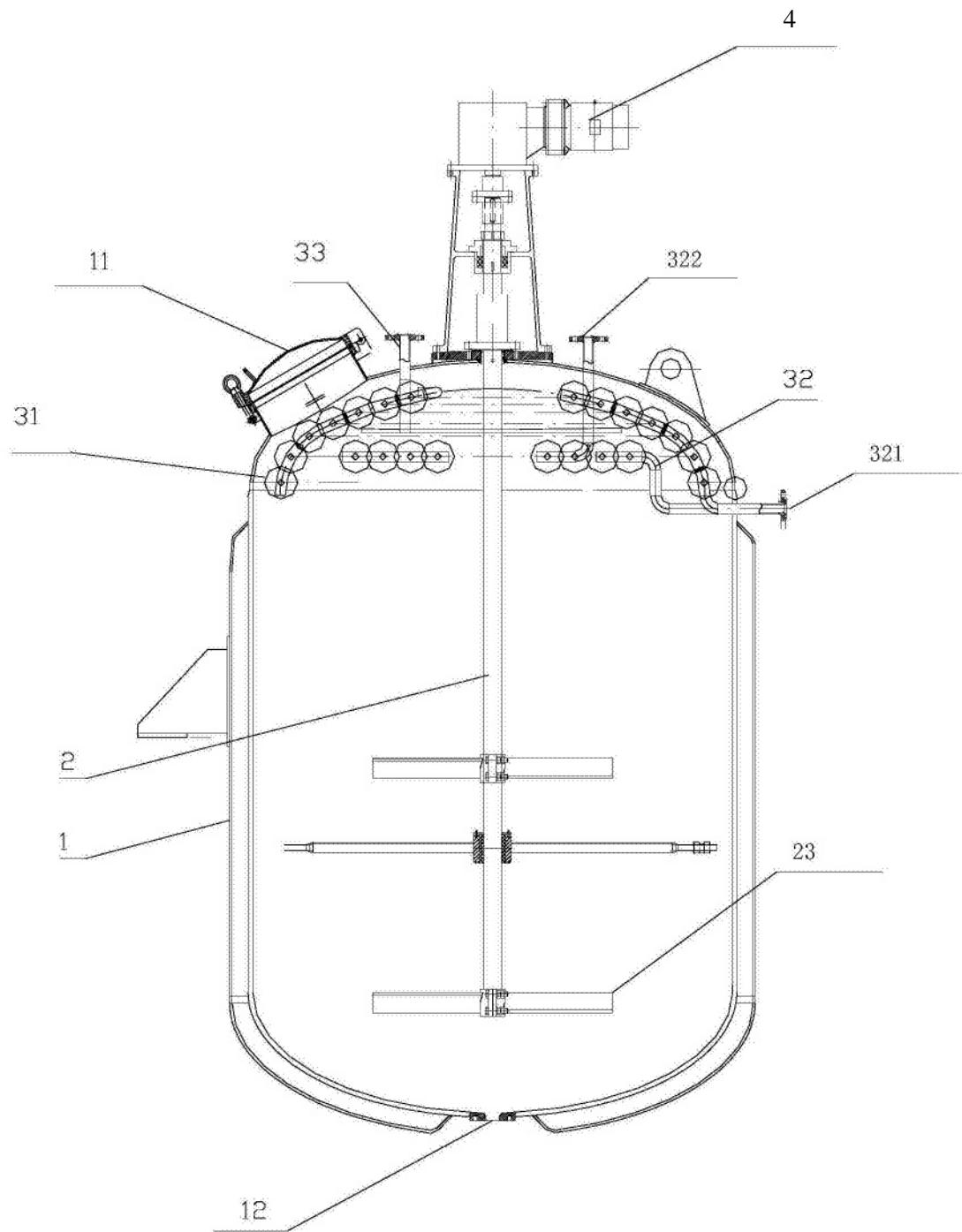


图1



(12) Utility model patent

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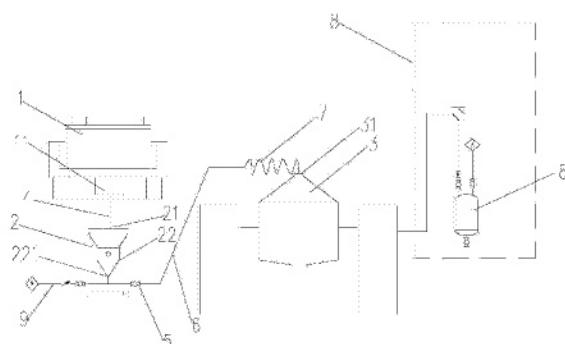
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(54) Name of the utility model

- Closed transfer device containing organic solvent material

(57) Abstract

The utility model discloses a closed transfer device containing organic solvent materials, which comprises a sequential connection of a lower discharge centrifuge, a swinging pellet machine and a double-cone rotary dryer. The top of the swinging pellet machine is provided with a feed port, the bottom is provided with a bin, the bottom of the bin is provided with a discharge port: the feed port is communicated with the bottom discharge port of the lower discharge centrifuge; The discharge port is communicated with the inlet pipe of the double-cone rotary dryer. The utility model has the advantages of effectively avoiding the leakage of organic solvent, improving the degree of automation and safety; The material quality is reduced after centrifugation, convenient transportation, and there will be no dust leakage in the conveying process of the material, which reduces the physical injury to the operator and the pollution to the environment.



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1. A closed transfer device containing organic solvent materials is characterized in that it comprises a sequential unloading centrifuge (1), a swinging pellet machine (2) and a double-cone rotary dryer (3). The top of the swinging pellet machine (2) is provided with a feed port (21) and the bottom is provided with a silo (22). The bottom of the silo (22) is provided with a discharge port (221); The feed port (21) is connected with the bottom discharge port (11) pipe of the bottom discharge centrifuge (1); The discharge port (221) is communicated with the inlet (31) pipe of the double cone rotary dryer (3).

2. As described in claim 1, a closed transfer device containing organic solvent materials is characterized in that the swinging pellet machine (2) is a sealed structure.

3. A closed transfer device containing organic solvent materials as described in claim 2 is characterized in that the bottom discharge port (11) of the bottom discharge centrifuge (1) is connected with the feed port (21) of the swing granulator (2) through the first connecting pipe (4).

4. As described in claim 1, a closed rotating device containing organic solvent materials is characterized in that the pipe between the discharge port (221) and the double cone rotary dryer (3) is provided with a ball valve (5), and the ball valve (5) is connected through the second connecting pipe (6), the third connecting pipe (7) and the top of the double cone rotary dryer (3) The inlet (31) is connected through.

5. As described in claim 4, a closed transfer device containing organic solvent materials is characterized in that the third connecting pipe (7) is a soft connecting pipe.

6. As described in claim 1, a closed transferring device containing organic solvent materials is characterized in that: the double-cone rotary dryer (3) is equipped with a vacuum device, the vacuum device (8) includes a buffer tank (81) and the corresponding pipeline, control valve, the buffer tank (81) of the air outlet and the double-cone rotary dryer (3) of the inner cavity pipeline is connected, The vacuum interface of the buffer tank is connected with the vacuum pump through the corresponding pipeline and the control valve.

- Variety containing organic material dense) reloading

Technical field

[0001] The utility model relates to a closed transfer device containing organic solvent materials, belonging to the technical field of transfer device.

Background technology

[0002] downdischarge centrifuge is mainly suitable for the separation of fine and medium-size suspension containing solid particles, especially for the separation of high viscosity, fine particle size, toxic and flammable materials, so it is widely used in chemical, pharmaceutical, environmental protection and other industries. After discharge centrifuge generally through the conveyor belt machine or manual handling will be the material transported to the next link of drying operation, but in the process of unloading is easy to produce dust, and more or less in the filter cake solvent residue, organic solvent gas volatilization is also easy to cause poisoning and environmental pollution and the formation of gas explosive mixture in the confined space, causing serious security risks And other problems. In addition, the quality of centrifugal materials is heavier when transported, the working environment of personnel is poor, and the labor intensity is large.

Content of utility model

[0003] In order to solve the above problems, the utility model provides a device for sealing and transferring materials containing organic solvents after centrifuge feeding, so as to solve the problems of hidden safety risks, poor working environment of personnel, high labor intensity and environmental pollution.

[0004] The technical scheme adopted by the utility model is:

[0005] A closed transfer device containing organic solvent materials, which is characterized in that: including a sequential connection of the lower discharge centrifuge, swinging pellet machine, double cone rotary dryer, the top of the swinging pellet machine is provided with a feed port, the bottom is provided with a bin, the bottom of the bin is provided with a discharge port; The feed port is connected with the bottom discharge port pipe of the discharging centrifuge; The discharge port is communicated with the inlet pipe of the double cone rotary dryer.

[0006] Preferably, the swinging pellet machine is a sealed structure.

[0007] Preferably, the bottom discharge port of the down-discharge centrifuge is connected to the feed port of the swinging granulator through a first connecting pipe.

[0008] Preferably, the pipe road between the discharge port and the double-cone rotary dryer is provided with a ball valve, and the ball valve is connected with the top inlet of the double-cone rotary dryer through the second connecting pipe and the third connecting pipe. [0009] More preferably, the third connected pipe is a soft connected pipe.

[0010] Preferably, the double cone rotary dryer is equipped with a vacuum device, the vacuum device comprises a buffer tank and the corresponding pipeline, control valve, the buffer tank of the air outlet and the double cone rotary dryer cavity pipeline is connected, the buffer tank vacuum interface through the corresponding pipeline, the control valve is connected with the vacuum pump, can form a vacuum or negative pressure environment in the double cone rotary dryer cavity, Facilitate the drying of materials in the cavity.

[0011] Preferably, the double cone rotary dryer is equipped with a gas supply device, and the air outlet of the vacuum device is connected with the inner chamber of the double cone rotary dryer, and nitrogen can be passed into the double cone rotary dryer.

[0012] The working process of the utility model is as follows: the material is discharged by the discharge centrifuge, and enters the rocking granulator through the first connecting pipe. The rocking granulator is used for rocking granulator after the material enters the bin at the bottom of the rocking granulator, and the material in the bin is transported into the double-cone rotary dryer for drying by using vacuum and (or) nitrogen. Wherein the swinging granulator

It is designed as a sealed structure, which avoids the leakage of organic solvent and improves the degree of automation and safety. In the conveying process, there will be no dust leakage, reducing the physical injury to the operator and the pollution to the environment.

[0013] The utility model has the advantages of effectively avoiding the leakage of organic solvent, improving the degree of automation and safety; The material quality is reduced after centrifugation, convenient transportation, and there will be no dust leakage in the conveying process of the material, and the physical injury to the operator and the pollution to the environment are reduced.

Illustration with picture

[0014] FIG. 1 is a structural drawing of the utility model.

[0015] The drawings are described as follows :1- lower discharge centrifuge; 11- bottom discharge port; 2- Swing granulator; 21- feed port; 22- silo; 221- discharge port; 3-double cone rotary dryer; 31- inlet; 4- First connecting pipe; 5-ball valve; 6-second connecting pipe; 7- third connecting pipe; 8- Vacuuming device; 9- air supply device.

Specific implementation method

[0016] The specific embodiments of the utility model are described in detail in combination with the attached drawings. It should be understood that the specific embodiments described herein are only used to illustrate and explain the embodiments of the utility model and are not used to limit the embodiments of the utility model.

[0017] It should be noted that the embodiments of the utility model and the features in the embodiments can be combined with each other, provided that there is no conflict.

[0018] In the description of the utility model, the need to understand is that the term "the center", "vertical", "horizontal", "length", "width" and "thickness", "up", "down", "before" and "after", "left", "right" and "vertical", "level", "top", "bottom" "within" and "outside", "clockwise" and "rotate", "axis", "radial" The azimuth or position relationship indicated by, "circumference", etc., is based on the azimuth or position relationship shown in the attached figure, only to facilitate the description of the utility model and simplify the description, but not to indicate or imply that the device or element referred to must have a specific orientation, construction and operation in a specific orientation, so it cannot be understood as a limitation of the utility model.

[0019] In addition, the terms "first" and "second" are used for descriptive purposes only and are not to be understood as indicating or suggesting relative importance or as implicitly indicating the quantity of the indicated technical features. Thus, a feature qualified as "first" or "second" may explicitly or implicitly include at least one of those features. In the description of the utility model," multiple "means at least two, such as two, three, etc., unless otherwise expressly and specifically defined.

[0020] In the utility model, unless otherwise expressly specified and limited, the terms "installation", "connection", "connection", "fixed" and other terms shall be broadly understood, for example, can be fixed connection, can also be detachable connection, or into one; Can be mechanical connection, can also be electrical connection or can communicate with each other; It can be directly connected, or indirectly connected through an intermediate medium, and it can be a connection within two components or an interaction between two components, unless otherwise expressly defined. For ordinary technical personnel in the field, the specific meaning of the above terms in the utility model can be understood according to the specific circumstances.

[0021] In the utility model, unless otherwise expressly specified and limited, the first feature is "above" or "below" the second feature.

The first and second features may be directly contacted, or the first and second features may be indirectly contacted through an intermediate medium. Moreover, the first feature is "above", "above" and "above" the second feature, but the first feature is directly above or diagonally above the second feature, or simply indicates that the first feature is higher in level than the second feature. The first feature being "below", "below", and "below" the second feature can mean that the first feature is directly or diagonally below the second feature, or simply that the first feature is less horizontal than the second feature. [0022] In the description of this specification, refer to the terms "one embodiment," "some embodiments," "examples," "specifically shown

Example ", or "some examples", etc., means that the specific features, structures, materials or characteristics combined with the embodiment or description of the example are contained in at least one embodiment or example of the utility model. In this specification, the schematic expression of the above terms must not be directed to the same embodiment or example. Furthermore, the specific features, structures, materials or features described may be combined in an appropriate manner in any one or more embodiments or examples. In addition, without contradicting each other, persons skilled in the art may combine and combine the different embodiments or examples described in this specification and the features of different embodiments or examples.

[0023] The utility model is described in detail below by reference to the attached drawings and in conjunction with exemplary embodiments.

[0024] The utility model relates to a closed rotating device containing organic solvent materials, which comprises a sequential unloading centrifuge 1, a swinging pellet machine 2, a double-cone rotary dryer 3, the top of the swinging pellet machine 2 is provided with a feed port 21, the bottom is provided with a bin 22, the bottom of the bin 22 is provided with a discharge port 221; The feed port 21 is communicated with the bottom discharge port 11 pipeline of the discharging centrifuge 1; The discharge port 221 is communicated with the inlet 31 pipe of the double cone rotary dryer 3.

[0025] In some embodiments of the utility model, the swinging granulator 2 has a sealed structure. The motor inside the rocking granulator 2 adopts explosion-proof motor.

[0026] In some embodiments of the utility model, the bottom discharge port 1 of the down-discharge centrifuge 1 is connected with the feed port 21 of the swinging granulator 2 through the first connecting pipe 4.

[0027] In some embodiments of the utility model, the pipe path between the discharge port 221 and the double-cone rotary dryer 3 is provided with a ball valve 5, and the ball valve 5 is connected with the inlet 31 of the double-cone rotary dryer 3 through the second connecting pipe 6 and the third connecting pipe 7. The conveying of materials can be controlled by controlling the ball valve 5.

[0028] In some embodiments of the utility model, the first connecting pipe 4 is a soft connecting pipe.

[0029] In some embodiments of the utility model, the silo 22 is a cone structure.

[0030] In some embodiments of the utility model, the third connecting pipe 7 is a soft connecting pipe. The double cone rotary dryer 3 can be unhindered during operation.

[0031] In some embodiments of the utility model, the top and bottom of the rotary simplified parts of the double cone rotary dryer 3 are conical, facilitating the aggregation of materials.

[0032] In some embodiments of the utility model, the double-cone rotary dryer 3 is equipped with a vacuuming device 8, the vacuum device 8 comprises a buffer tank 81 and a corresponding pipeline and a control valve, and the suction port of the buffer tank 81 is communicated with the inner cavity pipeline of the double-cone rotary dryer 3, and the vacuum interface of the buffer tank can be connected in the double cone through the corresponding pipeline and the control vacuum pump. The inner cavity of the rotary dryer 3 forms a vacuum or negative pressure environment, which is convenient for the drying of materials in the cavity. The vacuum pump is connected at place A in Figure 1.

[0033] In some embodiments of the utility model, the rocking pellet machine 2 is equipped with a gas supply device 9, and the air outlet of the gas supply device 9 is connected with the inner cavity of the rocking pellet machine 2 through a pipeline and a regulating valve, and nitrogen can be passed into the rocking pellet machine 2 to facilitate material conveying and protection.

[0034] The working process of the utility model is as follows: the material is discharged through the unloading centrifuge 1 after centrifugation, and enters the swinging granulator 2 through the first connecting pipe 4, and the swinging granulator 2 is used to swing the material into the silo 22 at the bottom of the swinging granulator 2. By using vacuum and (or) nitrogen, the material in the bin 22 is transported into the double cone rotary dryer 3 for drying. The swinging pellet machine 2 is designed as a sealed structure, which avoids the leakage of organic solvent and improves the degree of automation and safety. In the conveying process, there will be no dust leakage, reducing the physical injury to the operator and the pollution of the environment. Although embodiments of the utility model have been shown and described above, it is understood that the embodiments above are exemplary and cannot be understood

In order to limit the utility model, the common technical personnel in the field may, within the scope of the utility model, change, modify, replace and variant the said embodiments.

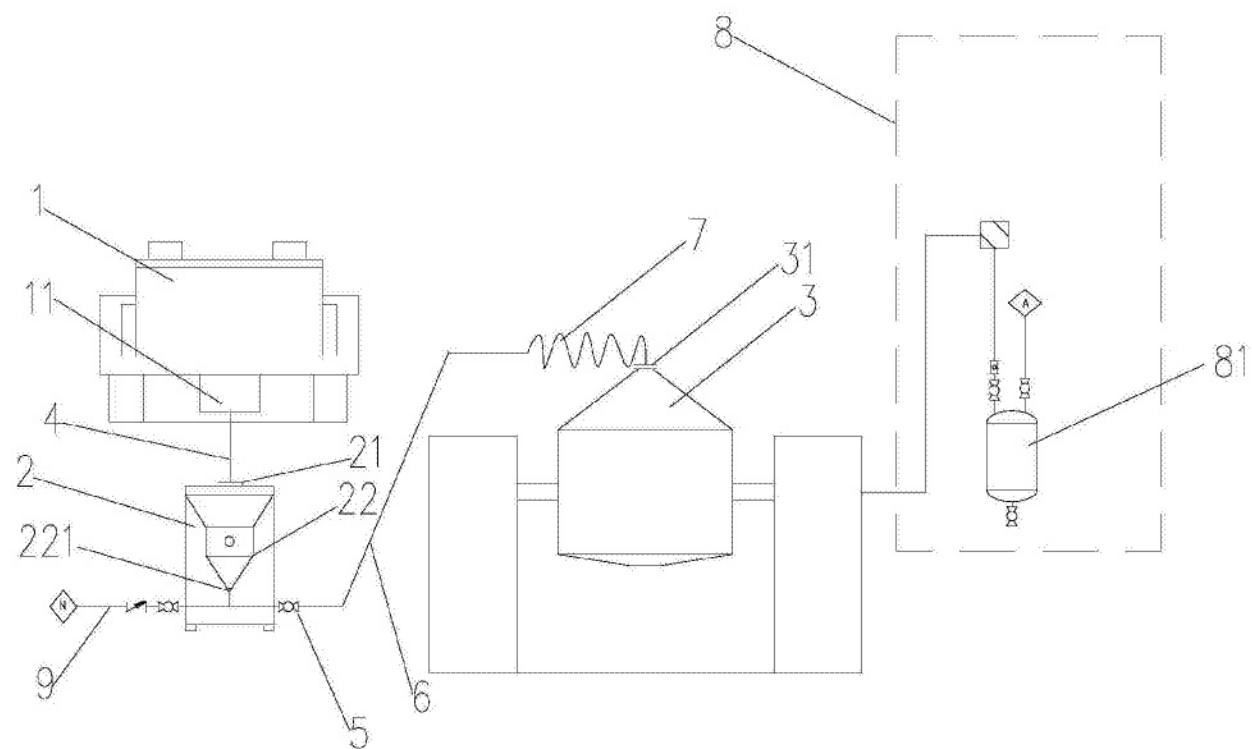


Figure 1



(12) Utility model patent

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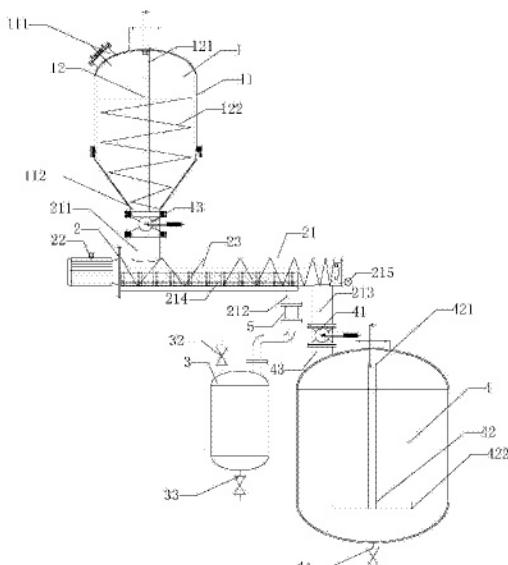
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(54) Name of utility model

A closed press filter conveying device for viscous materials

(57) Abstract

The utility model discloses a closed press filter conveying device suitable for viscous materials, which comprises a feeding reaction kettle, a screw press filter conveyor, a liquid collection tank and a solid collection reaction kettle; The feed reactor comprises the kettle body and the first stirring device; the screw filter conveyor is arranged under the feed reactor, including the filter press cylinder, the frequency conversion motor and the push screw, the internal conveying chamber of the filter press cylinder, the front end of the filter press cylinder is provided with a filter press inlet, the end is provided with a filter press outlet and a filter press solid outlet, the filter press inlet is communicated with the outlet pipe; The lower part of the conveying chamber is provided with a filter plate, one end of the filter plate is connected to the inner wall of the filter cylinder near the filter press inlet, and the other end is connected to the inner wall of the filter press simplified at the outlet of the filter press body; The liquid collection tank is connected with the press filtrate body outlet pipeline; The solid collection reactor is communicated with the press filtrate solid outlet pipeline. The utility model has the advantages of effectively preventing pipeline clogging, convenient cleaning and enhancing the solid-liquid separation effect.



NO. 219688748

1. A closed press filter conveying device suitable for viscous materials, which is characterized in that it comprises a feed reactor (1), a screw press filter conveyor (2), a liquid collection tank (3) and a solid collection reactor (4);

The feed reactor (1) comprises a kettle body (11) and a first stirring device (12) arranged in the kettle body, the kettle body (11) is provided with a reaction chamber for material reaction, and the top of the kettle body (11) is provided with a feed port (111) communicated with the reaction chamber. The bottom of the kettle body (11) is provided with a discharge port (112) connected with the reaction chamber;

The screw filter press conveyor (2) is arranged under the feed reactor (1), including the filter press cylinder (21), frequency conversion motor (22) and the propulsion screw (23), the filter press cylinder (21) is provided with a conveying chamber, the filter press cylinder (21) is provided with the front end of the filter press inlet (211) connected with the conveying chamber. The end of the filter press cylinder (21) is provided with a press filtrate body outlet (212) and a press filter solid outlet (213), and the press filter inlet (211) is connected with the discharge port (112) pipeline; The press filtrate body outlet (212) is located between the press filter inlet (211) and the press filter solid outlet (213); The lower part of the conveying chamber is provided with a filter plate (214), one end of the filter plate (214) is connected to the inner cylinder wall of the filter cylinder body (21) near the filter inlet (211), and the other end is connected to the inner wall of the filter simplified (21) at the filter outlet (212); Variable frequency motor (22) and the push screw (23) are arranged on both sides of the press cylinder (21), the push screw (23) can be rotationally supported in the press cylinder (21), the push screw (23) is located above the filter plate (214), and the power input end of the push screw (23) is connected with the power output end of the variable frequency motor (22);

The liquid collection tank (3) is communicated with the press filtrate body outlet (212) pipeline;

The solid collection reactor (4) is communicated with the press filtrate solid outlet (213) pipeline.

2. As described in claim 1, a closed pressure filter conveying device suitable for viscous materials is characterized in that the bottom of the kettle body (11) is cone-shaped, and the discharge port (112) of the kettle body (11) is equipped with a feed control valve (13).

3. As described in claim 1, a closed press filter conveying device suitable for viscous materials is characterized in that the first mixing device (12) is a downward pressure type screw belt mixing paddle, including a first mixing shaft (121) and a screw belt mixing paddle (122) arranged on the first mixing shaft (121). , the first mixing shaft (121) is arranged in a reaction chamber; The belt type stirring paddle (122) is arranged on the first stirring shaft (121).

4. As described in claim 1, 2 or 3, a closed press filter conveying device suitable for viscous materials is characterized in that the top of the liquid collection tank (3) is provided with a liquid inlet (31) and a vacuum outlet (32), and the bottom of the liquid collection tank (3) is provided with a liquid outlet (33). , the liquid inlet (31) is connected with the press filtrate body outlet (212) pipeline; The vacuum port (32) is connected with the vacuum system pipe, and the corresponding control valve is provided at the liquid outlet (33); An observation sight (5) is arranged on the pipe between the liquid intake port (31) of the liquid collection tank (3) and the press filtrate body outlet (212).

5. As described in claim 4, a closed press filter conveying device suitable for viscous materials is characterized in that the screw E of the propulsion screw (23) gradually shrinks along the direction of material conveying.

6. As described in claim 1, a closed press filter conveying device suitable for viscous materials is characterized in that the filter plate (214) is a metal sintered filter plate with a pore size of 2 to 100 microns.

A closed press filter conveying device for viscous materials as described in claim 1 is characterized in that the pipe between the press filter solid outlet (213) and the solid collection reactor (4) is provided with a discharge control valve (41).

A closed press filter conveying device for viscous materials as described in claim 1 is characterized in that the end of the press filter cylinder (21) is provided with a pressure transmitter (215).

- Suitable * EE filter loading

Technical field

[0001] The utility model relates to a closed press filter conveying device suitable for viscous materials, belonging to the technical field of solid-liquid separation in chemical, pharmaceutical and other industries.

Background technology

[0002] In the fields of fine chemical industry and pharmaceutical industry, solid-liquid separation of materials is often involved. Usually can be used rotary drum centrifuge, sedimentation centrifuge, cloth bag filter, three-in-one filter and other devices to achieve solid-liquid separation operation. However, for viscous materials, it is easy to cause the filter bag of rotary drum centrifuge to be bonded and block the liquid filter channel; Sedimentation centrifuge separation power is insufficient, the effect is not good; The same effect of using cloth bag centrifuge and three-in-one filter is not good. Analyze the reasons, on the one hand, the solid material has a certain viscosity, easy to deform, so that it is drilled into the filter medium aperture, blocking the pipeline; On the other hand, it is also insufficient filtration power, which can not provide enough force to make solid-liquid separation.

Utility model content

[0003] Aiming at the problems of the prior art, the utility model provides a closed press filter conveying device suitable for viscous materials, which can effectively prevent pipeline clogging, facilitate cleaning and enhance the effect of solid-liquid separation.

[0004] The utility model relates to a closed press filter conveying device suitable for viscous materials, which is characterized in that it comprises a feeding reactor, a screw press filter conveyor, a liquid collection tank and a solid collection reactor;

[0005] the feed reactor comprises a kettle body and a first stirring device arranged in the kettle body, the kettle body is provided with a reaction chamber for material reaction, the top of the kettle body is provided with a feed port communicated with the reaction chamber, the bottom of the kettle body is provided with a discharge port communicated with the reaction chamber;

[0006] The screw filter press conveyor is arranged under the feed reactor, including the filter press simplified, frequency conversion motor and the push screw, the filter press cylinder internal conveying chamber, the filter press simplified front end is provided with a filter press inlet communicated with the conveying chamber, the filter press cylinder end is provided with a filter press outlet and filter solid outlet communicated with the conveying chamber, filter press inlet and outlet pipe The road is communicated; The press filtrate body outlet is located between the press filter inlet and the press filter solid outlet; The lower part of the conveying chamber is provided with a filter plate, one end of the filter plate is connected to the inner wall of the filter simplified near the filter inlet, and the other end is connected to the inner wall of the filter cylinder at the outlet of the filter body; Variable frequency motor and the propulsion screw are arranged on both sides of the filter cylinder, the propulsion screw can be rotationally supported in the filter cylinder body, the propulsion screw is located above the filter plate, and the power input end of the propulsion screw is connected with the power output end of the variable frequency motor;

[0007] the liquid collection tank is communicated with the outlet pipe of the press filtrate body;

[0008] the solid collection reactor is communicated with the press filtrate solid outlet pipeline.

[0009] Further, the bottom of the kettle body is shaped like a cone, and the discharge port of the kettle body is equipped with a feed control valve.

[0010] Further, the first mixing device is a downward pressure type screw belt mixing paddle, including a first mixing shaft and a screw belt mixing paddle arranged on the first mixing shaft. The first mixing shaft is arranged in a reaction chamber and can rotate around a central axis perpendicular to the horizontal plane; The screw belt impeller is arranged on the first mixing shaft, which can stir the materials in the reaction chamber and push the materials to the discharge port.

[0011] Further, the top of the liquid collection tank is provided with a liquid inlet and a vacuum outlet, and the bottom of the liquid collection tank is provided

The part is provided with a liquid outlet, and the liquid inlet is communicated with the press filtrate body outlet pipe; The vacuum port is communicated with the vacuum system pipe, and the corresponding control valve is provided at the liquid outlet; An observation cup is arranged on the pipe between the liquid inlet of the liquid collection tank and the outlet of the pressure filtrate body.

[0012] Further, the inlet of the observation cup is connected with the outlet of the press filtrate body, and the outlet of the observation cup is connected with the inlet of the liquid collection tank.

[0013] Further, the pitch of the propulsive screw is gradually reduced along the direction of material conveying.

[0014] Further, the filter plate is a metal sintered filter plate with a diameter of 2 to 100 microns.

[0015] Further, a pipe path between the solid press outlet and the solid collection reactor is provided with a discharge control valve.

[0016] Further, the end of the filter press cylinder is provided with a pressure transmitter.

[0017] The working process of the utility model is: the material enters the screw press filter conveyor from the feed reactor, and controls the opening of the feed control valve, the speed of the first stirring device, the speed of the advance screw of the screw press filter conveyor, the opening of the discharge control valve and other operating parameters to control the press filter conveying process, so as to achieve the purpose of solid-liquid separation of the viscous material. By controlling the vacuum degree of the liquid collection tank, the solid-liquid separation effect can be further enhanced and the liquid content in the solid can be reduced.

[0018] The utility model has the advantages that: (1) the simplified character adopts the detachable design, which is convenient for equipment cleaning; (2) Adopting a fully sealed design, the utility model can adapt to the solid-liquid separation requirements of viscous materials containing organic solvents; (3) the filtration power is sufficient, by controlling the vacuum of the liquid collection tank, the solid-liquid separation effect can be further enhanced and the liquid content in the solid can be reduced; (4) The filtration effect is good, and the pipeline is not easy to clog.

Illustration with picture

[0019] Figure 1 is a structure diagram of the utility model.

[0020] FIG. 2 is the installation diagram of the filter press simplified part of the utility model.

Specific implementation mode

[0021] The specific embodiments of the utility model are described in detail in combination with the attached drawings. It should be understood that the specific embodiments described herein are only used to illustrate and explain the embodiments of the utility model and are not used to limit the embodiments of the utility model.

[0022] It should be noted that the embodiments of the utility model and the features in the embodiments can be combined with each other, provided that there is no conflict.

[0023] In the description of the utility model, the need to understand is that the term "the center", "vertical", "horizontal", "length", "width" and "thickness", "on" and "down", "before" and "after", "left", "right" and "vertical", "level", "top", "bottom" "within" and "outside", "clockwise" and "rotate", "axis", "radial" The azimuth or position relationship indicated by, "circumference", etc., is based on the azimuth or position relationship shown in the attached figure, only to facilitate the description of the utility model and simplify the description, but not to indicate or imply that the device or element referred to must have a specific orientation, construction and operation in a specific orientation, so it cannot be understood as a limitation of the utility model.

[0024] In addition, the terms "first" and "second" are used for descriptive purposes only and are not to be understood as indicating or suggesting relative importance or as implicitly indicating the quantity of the indicated technical features. Thus, a feature qualified as "first" or "second" may explicitly or implicitly include at least one of those features. In the description of the utility model, the meaning of "multiple" is at least two, such as two, three, etc., unless otherwise expressly and specifically defined.

[0025] In the utility model, the terms "installation", "connected", "connected", "solid", unless otherwise expressly specified and limited

Terms such as "fixed" should be understood in a broad sense, for example, it can be a fixed connection, it can be a detachable connection, or it can be a whole; It can be a mechanical connection, it can also be an electrical connection or it can communicate with each other; It can be directly connected, or indirectly connected through an intermediate medium, and it can be a connection within two components or an interaction between two components, unless otherwise expressly defined. For ordinary technical personnel in the field, the specific meaning of the above terms in the utility model can be understood according to the specific circumstances. [0026] In the utility model, unless otherwise expressly specified and limited, the first feature "above" or "below" the second feature may be the first and second features in direct contact, or the first and second features in indirect contact through an intermediate medium. Moreover, the first feature is "above", "above" and "above" the second feature, but the first feature is directly above the second feature or diagonally above the second feature, or merely indicates that the first feature is higher than the second feature. The first feature being "below", "below", and "below" the second feature can mean that the first feature is directly or diagonally below the second feature, or simply that the first feature is less horizontal than the second feature.

[0027] In the description of this specification, the description of the reference terms "an embodiment", "some embodiments", "examples", "specific examples", or "some examples", etc., means that the specific features, structures, materials, or features described in conjunction with the embodiment or example are contained in at least one embodiment or example of the utility model. In this specification, the schematic expression of the above terms must not be directed to the same embodiment or example. Furthermore, the specific features, structures, materials or features described may be combined in an appropriate manner in any one or more embodiments or examples. In addition, without contradicting each other, persons skilled in the art may combine and combine the different embodiments or examples described in this specification and the features of different embodiments or examples.

[0028] The utility model is described in detail below by reference to the attached drawings and in conjunction with exemplary embodiments.

[0029] The utility model relates to a closed press filter conveying device suitable for viscous materials, which is characterized in that it comprises a feeding reactor 1, a screw press filter conveyor 2, a liquid collection tank 3 and a solid collection reactor 4;

[0030] the feed reactor 1 comprises a kettle body 11 and a first stirring device 12 arranged in the kettle body 11 is provided with a reaction chamber for material reaction, the top of the kettle body 11 is provided with a feed port 111 communicated with the reaction chamber, the bottom of the kettle body 11 is provided with a discharge port 112 communicated with the reaction chamber;

[0031] The screw filter press conveyor 2 is arranged under the feed reactor 1, comprising a filter press simplified 21, a frequency conversion motor 22 and a propulsion screw 23, the filter press simplified 21 internal conveying chamber, the filter press simplified 21 is provided with a filter press inlet 211 communicated with the conveying chamber, the filter press simplified 21 is provided with a filter press outlet communicated with the conveying chamber 212 and press filter solid outlet 213, press filter inlet 211 and discharge port 12 pipeline communication; The press filtrate body outlet 212 is located between the press filtration inlet 211 and the press filtration solid outlet 213; The lower part of the conveying chamber is provided with a filter plate 214, one end of the filter plate 214 is connected to the inner wall of the filter simplified 21 near the filter inlet 211, and the other end is connected to the inner cylinder wall of the filter simplified 21 at the press filtration outlet 212; Variable frequency motor 22 and the push screw 23 are arranged on both sides of the press cylinder 21, the push screw 22 can be rotationally supported in the press cylinder 21, the push screw 22 is located above the filter plate 214, and the power input end of the push screw 22 is connected with the power output end of the variable frequency motor 23;

[0032] the liquid collection tank 3 is communicated with the press filtrate body outlet 212 pipeline;

[0033] the solid collection reactor 4 is communicated with the press filtrate solid outlet 213 pipeline.

[0034] In some embodiments of the utility model, the bottom of the kettle body 11 is shaped like a cone, the discharge port 12 of the kettle body 11 is equipped with a feeding control read 13, the seal between the kettle body 11 and the screw press filter conveyor 2 is good, and the feeding speed of the screw press filter conveyor 2 can be adjusted by adjusting the control read 13.

[0035] In some embodiments of the utility model, the first stirring device 12 is a downward pressure type screw belt stirring paddle, including a first stirring shaft 121 and a screw belt stirring paddle 122 arranged on the first stirring shaft 121. The first stirring shaft 121 is arranged in a reaction chamber and can rotate around the central axis perpendicular to the horizontal plane; The belt type stirring paddle 122 is arranged in the first stirring

Shaft 121 is capable of stirring the material in the reaction chamber and pushing the material to the discharge port 112.

[0036] In some embodiments of the utility model, the variable frequency motor is an explosion-proof stepless variable frequency motor.

[0037] In some embodiments of the utility model, the filter press cylinder is a horizontal hollow cylinder, including an upper half cylinder and a lower half cylinder, and the upper half simplified is assembled into a complete sealing simplified by sealing accessories and the lower half simplified, and the upper half cylinder is well sealed between the lower half cylinder and the upper half cylinder. Filter cylinder close to the feed reactor end for the front end, away from the feed reactor end for the end, the front end of the upper half of the simplified is provided with a feed port 111, the lower half of the cylinder body detachable is arranged on the horizontal filter plate, the edge of the filter plate is connected to the inner wall of the lower half of the simplified, and the end of the filter plate extends to the press filtrate body outlet 212, can press the filter cylinder body. The material formed after the reaction is filtered and separated by solid material and liquid material. The liquid material is discharged from the press filtrate body outlet 212 to the liquid collection tank 3, and the solid material is discharged from the press filter solid outlet 213 into the solid collection reactor 4. The sealing accessories include half pipe opening flange 24 and teflon gasket 25, the upper half simplified and the lower half cylinder through the half pipe opening flange 24, teflon gasket 25 assembled into a complete and sealed filter press simplified. The filter press cylinder gradually decreases in diameter along the material transfer direction.

[0038] In some embodiments of the utility model, the top of the liquid collection tank 3 is provided with a liquid inlet port 31 and a vacuum port 32, the bottom of the liquid collection tank 3 is provided with a liquid outlet 33, and the liquid inlet port 31 is communicated with the press filtrate body outlet 212 pipeline; The vacuum port 32 is communicated with the vacuum system pipe, which can facilitate the liquid material in the screw filter conveyor to be transported to the filtrate collection tank; The outlet 33 are provided with the corresponding control valve; An observation cup 5 is arranged on the pipe between the liquid intake port 31 of the liquid collection tank 3 and the press filtrate body outlet 212

[0039] In some embodiments of the utility model, the inlet of the observation cup 5 is connected with the outlet 212 of the press filtrate body, and the outlet of the observation cup 5 is connected with the inlet 31 of the liquid collection tank 3.

[0040] In some embodiments of the utility model, the pitch of the propulsive screw 23 is gradually reduced along the direction of material conveying.

[0041] In some embodiments of the utility model, the filter plate 214 is a metal sintered filter plate with a pore size of 2 to 100 microns.

[0042] In some embodiments of the utility model, a discharge control valve 41 is arranged on a pipe between the solid outlet 213 of the filter press and the solid collection reactor 4.

[0043] In some embodiments of the utility model, the end of the press filtration simplified 21 is provided with a pressure transmitter 215, which is used to detect the pressure inside the conveying chamber.

[0044] In some embodiments of the utility model, the solid collection reactor 4 is provided with a second stirring device 42, including a second stirring shaft 421 and a stirring paddle 422 arranged on the second stirring shaft 421, the second stirring shaft 421 is arranged in the solid collection reactor 4 and can be rotated around the central axis perpendicular to the horizontal plane; Stirring paddle 422 is arranged on the second stirring shaft 421, can stir the material in the reaction chamber, solid collection reactor 4 is provided with solid inlet 43 and solid outlet 44, solid inlet 43 and press filter solid outlet 213 pipeline communication.

[0045] The protection of the utility model is suitable for the specific application of the viscous material filter conveying device, such as the following:

[0046] Application Example 1:

[047] Taking the crude sucrose ester as an example, the crude sucrose ester is pretreated and sent to the filter press process. [048] Turn on the variable frequency motor 22, feed control valve 13, the first mixing device 12, and the material is filtered under the action of the screw type mixing paddle 122 and the propulsion screw 23 and transported along the press filter simplified 21. When the material reaches the bottom of the conveying chamber, when the pressure transmitter 215 detects that the pressure in the conveying chamber is 1.5~2.5MPa, open and adjust the discharge valve 41, and control the pressure transmitter 215 detects that the pressure in the conveying chamber is 1.5~2.5MPa. The filtrate flow rate and solid content can be observed from the observation glass 5. In order to speed up the filtration press speed and strengthen the filtration effect, the vacuum port 32 on the liquid collection tank 3 can be opened to connect the filtrate collection tank 3 with the external vacuum system

Connect. After press filtration, the solid material and filtrate enter the next process respectively. It takes about 3 hours for the whole batch of materials to be processed. Take the solid material, multi-point sampling test dry weight loss, 27.7~33.2%.

[0049] For the ratio:

[0050] The crude sucrose ester is pretreated and enters the solid-liquid separation process. The bamboo filter is used for filtration. Press the material into the bamboo filter and open the nitrogen pressure to 0.15MPa~0.2MPa. Press the filter until there is basically no liquid extrusion. It takes about 9 hours for the whole batch of material to be processed. Take the solid material, multi-point sampling test dry weight loss, 45.5~55.3%.

[0051] Although embodiments of the utility model have been shown and described above, it can be understood that the embodiments are exemplary and cannot be understood as limitations of the utility model, and that the embodiments may be changed, modified, replaced and modified by ordinary technicians in the field within the scope of the utility model.

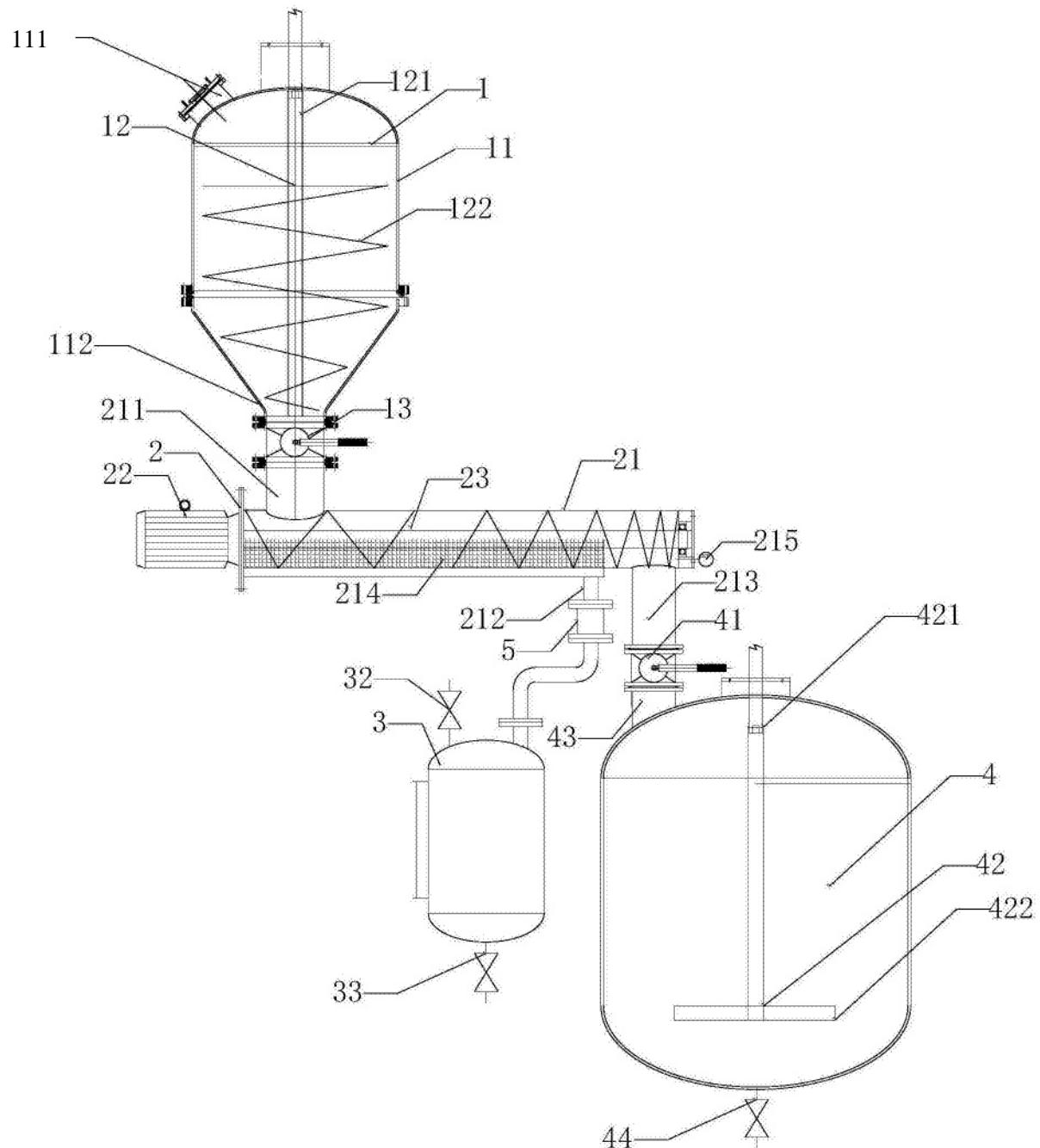


图1

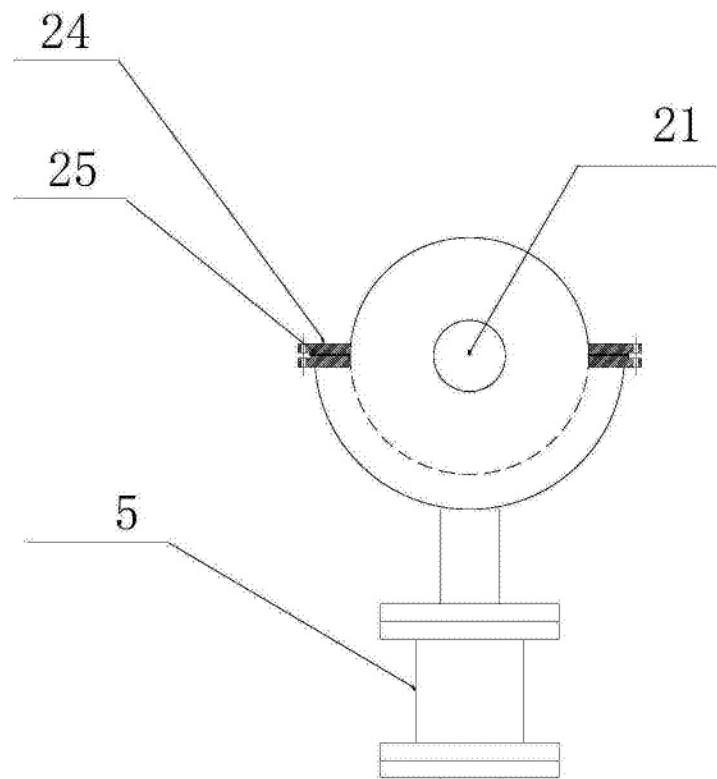


Figure 2



(12) Utility model patent

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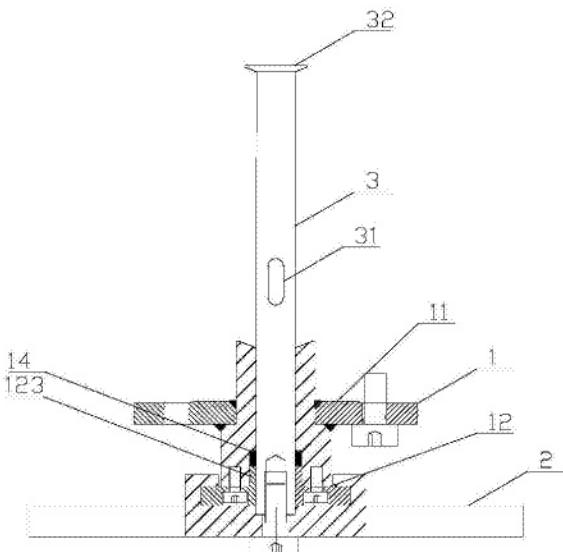
权利要求书1页 说明书5页 附图4页

(54) Utility model name

- A vacuum reaction system sampler

(57) Abstract

The utility model discloses a vacuum reaction system sampler, which comprises a sealed connector, a sampling handle and a sampling rod. The sealed connector comprises a connecting seat and a sealing gland, and the connecting seat is arranged at the side wall of the bottom head of the reactor; The center of the connecting seat is provided with a first sampling rod jack through the axial direction, and the rear of the first sampling rod jack is expanded to form a cavity; The sealing gland is arranged at the rear end of the connecting seat; The center of the sealing gland is provided with a second sampling rod jack, the second sampling rod jack and the first sampling rod jack coaxial setup; The front of the sampling rod is arranged in the reactor, the back end passes through the first sampling rod jack, the second sampling rod jack is connected with the sampling screw, the sampling rod, the sealing gland and the connecting seat surround the sealing chamber; The sampling rod is provided with a material sampling groove; The sampling lever is removable and connected with the sealing gland. The utility model has the advantages of sampling the viscous material without destroying the vacuum and avoiding the phenomenon of oxidation decomposition, moisture absorption and so on when the reaction material touches the air.



1. A vacuum reaction system sampler is characterized in that it comprises a sealed connector (1), a sampling handle (2) and a sampling rod (3);

The sealing connector (1) comprises a connecting seat (11) and a sealing gland (12), and the connecting seat (11) is arranged on the side wall of the bottom head of the reactor; The center of the connecting seat (11) is provided with an axial through the first sampling rod jack (111), and the back of the first sampling rod jack (111) is expanded to form a cavity (112); The sealing gland (12) is arranged on the rear end of the connecting seat (11); The center of the sealing gland (12) is provided with a second sampling rod jack (121), and the second sampling rod jack (121) is provided with the first sampling rod jack (111);

The front of the sampling rod (3) is arranged in the reactor, and the back end of the sampling rod (3) runs through the first sampling rod jack (111), the second sampling rod jack (121) after connecting the sampling handle (2), the sampling rod (3), the sealing gland (12) and the connecting seat (11) surround to form a sealing chamber containing the seal or the sealing packing; The sampling rod (3) is provided with a material sampling groove (31);

The sampling lever (2) is detachable and the sealing gland (12) is connected, the sampling lever (2) has a locking position and a sampling position, when the sampling lever (2) is in the locking position, the sealing gland (12) is connected with the sampling lever (2), and the material sampling groove (31) is completely contained in the reactor; When the sampling handle (2) is in the sampling position, the sealing gland (12) is separated from the sampling handle (2), and the material sampling groove (31) is completely exposed to the reactor and the sealing connector (1) outside.

2. The vacuum reaction system sampler described in claim 1 is characterized in that the sealing gland (12) is clamped and separated from the sampling lever (2) by rotating clamping.

3. As the vacuum reaction system sampler described in claim 2, it is characterized in that the front part of the sampling handle (2) is provided with an open cavity that can contain the sealing gland (12), and the inner wall of the front end of the open cavity is provided with several radial limiting parts (21); The outer wall interval of the sealing gland (12) is provided with a number of radial clamp fittings (122), the radial clamp fittings (122) and the radial limit fittings (21)- a corresponding, and when the sampling handle (2) is in the locked position, the radial clamp fittings (122) are limited between the radial limit fittings (21) and the bottom surface of the opening cavity.

4. As the vacuum reaction system sampler described in claim 1, it is characterized in that the connecting seat (11) comprises a connecting part (101) and a fixed ring (102) arranged on the connecting part (101), the center of the connecting part (101) is provided with a first sampling rod jack (111), and the outer wall of the connecting part (101) is a step; Fixed ring (102) fixed sleeve is arranged on the outside of the connecting part (101), and connected with the ring step surface on the outer wall of the connecting part (101), and the connecting part (101) is connected with the reactor through the fixed ring (102).

5. The vacuum reaction system sampler described in claim 4 is characterized in that: the front end of the sampling rod (3) is provided with a convex front end limit ring (32); The front end of the connecting part (101) is provided with a limit bevel (113) fitted with the side wall of the front limit ring (32).

6. The vacuum reaction system sampler mentioned in claim 5 is characterized in that the front limit ring (32) is a reverse cone limit ring.

· The vacuum reaction system sampler as described in claim 1 is characterized in that a handle (22) is symmetrically arranged on the sampling handle (2).

The vacuum reaction system sampler as described in claim 1 is characterized in that the front face of the sealing gland (12) is provided with a splicing part (123), and the splicing part (123) is inserted into the annular gap between the cavity (112) and the sampling rod (3).

The invention relates to a vacuum reaction system sampler

Technical field

[0001] The utility model relates to a vacuum reaction system sampler, in particular to the sampling of high viscosity materials.

Background technology

[0002] In the field of synthesis and processing of polymer compounds or polymer materials, it is necessary to monitor the production process of high-viscosity materials, but in the prior art, high-viscosity materials such as sucrose fatty acid ester need to be sampled during the synthesis process, it is difficult to maintain the closed state of the reactor sampling, destroy the vacuum, the adverse reaction is carried out, and it is easy to expose the material to air, contact oxidation, moisture absorption, resulting in The color of the reaction material deteriorates, and the catalyst is destroyed.

Content of invention

[0003] In order to solve the above problems, the utility model provides a vacuum reaction system sampler which can maintain the vacuum degree in the reaction kettle and prevent the material from contacting the air.

[0004] The vacuum reaction system sampler of the utility model is characterized in that it comprises a sealed connector, a sampling handle and a sampling rod;

[0005] the sealed connector comprises a connecting seat and a sealing gland, and the connecting seat is arranged on the side wall of the bottom head of the reactor; The center of the connecting seat is provided with an axial through the first sampling rod jack, the back of the first sampling rod jack is expanded to form a concave cavity; The sealing gland is arranged at the back end of the connecting seat; The center of the sealing gland is provided with a second sampling rod jack, and the second sampling rod jack is coaxial with the first sampling rod jack;

[0006] The front of the sampling rod is arranged in the reactor, the back end of the sampling rod is sequentially through the first sampling rod jack, the second sampling rod jack is connected with the sampling screw, the sampling rod, the sealing gland and the connecting seat surround to form a sealing chamber to accommodate the seal or the sealing packing; The sampling rod is provided with a material sampling groove;

[0007] the sampling lever is detachable and the sealing gland is connected, the sampling lever has a locking position and a sampling position, when the sampling lever is in the locking position, the sealing gland is connected with the sampling lever, and the material sampling groove is completely contained in the reactor; When the sampling handle is in the sampling position, the sealing gland is detached from the sampling handle, and the material sampling groove is completely exposed to the reactor and the outside of the sealing connector.

[0008] Further, the seal gland is clamped and separated from the sampling handle by means of a rotary clamp.

[0009] Further, the front part of the sampling handle is provided with an opening cavity that can contain the sealing gland, and the inner wall of the front end of the opening cavity is provided with several radial limit parts; The outer wall interval of the sealing gland is provided with a number of radial clamp fittings, the radial clamp fittings correspond to the radial limit fittings one by one, and when the sampling screw is in the locked position, the radial clamp fittings are limited between the radial limit fittings and the bottom surface of the opening cavity.

[0010] Further, the connecting seat comprises a connecting part and a fixed ring arranged on the connecting part. The center of the connecting part is provided with a first sampling rod jack, and the outer wall of the connecting part is a step; The fixed ring fixed sleeve is arranged on the outside of the connecting part, and is connected with the annular step surface on the outer wall of the connecting part, and the connecting part is connected with the reactor through the fixed ring.

[0011] Further, the front end of the sampling rod is provided with a convex front end limit ring; The front end of the connecting part is provided with a limit bevel fit with the side wall of the front end limit ring.

[0012] Further, the front end limit ring is an inverted cone limit ring.

[0013] Further, the sampling handle is symmetrically provided with a handle.

[0014] Further, the front face of the sealing gland is provided with a splice part, which is tightly inserted into the annular gap between the cavity and the sampling rod.

[0015] In the normal reaction process of high viscosity material, without measuring the material, the sampling rod is inserted into the reactor, the sampling handle is in the locked position, the radial clamp on the sealing gland is tightly restricted between the radial limit of the sampling handle and the bottom surface of the open cavity, at this time the sealing gland is restricted in the open cavity, the sampling groove on the sampling rod completely falls into the reactor, because of the sampling rod And sealed between the connector, sealed between the connector and the bottom head of the reactor are well sealed, so that the reaction environment of the whole reactor will not be disturbed; If it is necessary to detect high-viscosity materials in the reactor, rotate the sampling handle, to seal the seal cap on the radial clamp from the radial limit of the sampling handle and the bottom of the open cavity after release, the sampling rod from the reactor, until the sampling rod on the material sampling groove is completely exposed to the reactor and the sealing connector outside, at this time the sampling handle is completed from the locking position to The change of sampling position; Because the sealing cavity is filled with sealing filler, the sampling rod is always well sealed with the sealing connector during the whole movement, so as to maintain the sealing in the reactor during the sampling process; After sampling and testing the high-viscosity material in the material sampling groove, the reverse operation is carried out until the sampling handle is re-converted from the sampling position to the locking position to complete the sampling.

[0016] The utility model has the advantages that the vacuum reaction system in the reactor can be maintained during the whole sampling process, and the viscous material can be sampled without destroying the vacuum, so as to monitor the reaction, speed up the progress, and avoid the phenomenon of oxidation decomposition and moisture absorption caused by the contact of the reaction material with air.

Illustrations are attached.

[0017] Figure 1 is a schematic diagram of the utility model.

[0018] Figure 2 is a structure diagram of the sealed connector of the utility model.

[0019] FIG. 3 is the top view of the sampling handle of the utility model.

[0020] Figure 4 is the top view of the sealing gland of the utility model.

[0021] FIG. 5 is an unsampled state diagram of the utility model.

[0022] FIG. 6 is the sampling state diagram of the utility model

Specific implementation mode

[0023] The specific embodiments of the present invention are described in detail in combination with the attached drawings. It should be understood that the specific embodiments described herein are used only to illustrate and explain the embodiments of the invention and are not used to limit the embodiments of the invention.

[0024] It should be noted that the embodiments of the invention and the features in the embodiments may be combined with each other, provided that there is no conflict.

[0025] In the description of the invention, it is to be understood that the terms "center," "longitudinal," "transverse," "length," "width." "Thickness" and "up", "down", "before" and "after", "left", "right" and "vertical", "level", "top", "bottom" "inside", "outside", "clockwise" and "rotate", "axis", "radial" and "to" indicates a location or position relations based on the location or position shown in the appended drawings, only is to facilitate the description of this invention and Jane The device or element referred to in the description, rather than the indication or implication, must have a specific orientation, be constructed and operated in a specific orientation, and therefore cannot be understood as a limitation of the invention.

[0026] Furthermore, the terms "first" and "second" are used for descriptive purposes only and are not to be understood as indicating or hinting at relative importance or as implicitly indicating the quantity of the technical features indicated. Thus, a feature qualified as "first" or "second" may explicitly or implicitly include at least one of those features. In the description of the present invention, "multiple" means at least two, e.g., two, three

One, etc., unless otherwise expressly and specifically qualified.

[0027] In the present invention, the terms "mounting", "connecting", "connecting", "fixing", etc. shall be understood broadly, unless otherwise expressly specified and limited, for example, may be fixed connections, removable connections, or integrated; It may be a mechanical connection or an electrical connection or can communicate with each other; It can be directly connected, or indirectly connected through an intermediate medium, and it can be a connection within two components or an interaction between two components, unless otherwise expressly defined. For persons of ordinary skill in the art, the specific meaning of the above terms in the present invention may be understood according to the circumstances.

[0028] In the present invention, unless expressly specified and qualified otherwise, the first feature "above" or "below" the second feature may be the first and second feature in direct contact, or the first and second feature in indirect contact through an intermediate medium. Furthermore, where the first feature is "above", "above" and "above" the second feature, the first feature is directly above or diagonally above the second feature, or merely indicates that the first feature is at a higher level than the second feature. The first feature being "below", "below" and "below" the second feature can mean that the first feature is directly or diagonally below the second feature, or simply that the first feature is less horizontal than the second feature.

[0029] In the description of this specification, the reference terms "an embodiment", "some embodiments", "examples", "specific examples", or "some examples", etc., are used to mean that the specific features, structures, materials, or features described in conjunction with the embodiment or example are contained in at least one embodiment or example of the invention. In this specification, the schematic expression of the above terms must not be directed to the same embodiment or example. Furthermore, the specific features, structures, materials or features described may be combined in an appropriate manner in any one or more embodiments or examples. In addition, without contradicting each other, persons skilled in the art may combine and combine the different embodiments or examples described in this specification and the features of different embodiments or examples.

[0030] The invention is described in detail below by reference to the attached drawings and in conjunction with exemplary embodiments.

[0031] The utility model relates to a vacuum reaction system sampler, which comprises a sealed connector 1, a sampling handle 2 and a sampling rod 3;

[0032] the sealed connector 1 comprises a connecting seat 11 and a sealing gland 12. The connecting seat 11 is arranged on the side wall of the bottom head of the reactor; The center of the connecting seat 11 is provided with an axial through the first sampling rod jack 111, and the back of the first sampling rod jack 111 is expanded to form a cavity 112; The sealing gland 12 is connected to the rear end of the connecting seat 11; The center of the sealing gland 12 is provided with a second sampling rod jack 121, and the second sampling rod jack 121 is coaxial with the first sampling rod jack 111;

[0033] The front of the sampling rod 3 is arranged in the reactor, and the back end of the sampling rod 3 passes through the first sampling rod jack 111, and the second sampling rod jack 121 is connected with the sampling screw 2, the sampling rod 3, the sealing gland 12 and the connecting seat 11 surround to form a sealing chamber containing the seal or the sealing packing; The sampling rod 3 is provided with a material sampling groove 31;

[0034] the sampling lever 2 is detachable connected with the sealing gland 12, the sampling lever 2 has a locking position and a sampling position, when the sampling lever 2 is in the locking position, the sealing gland 12 is connected with the sampling lever 2, and the material sampling groove 31 is completely contained in the reactor; When the sampling handle 2 is in the sampling position, the sealing gland 12 is detached from the sampling handle 2, and the material sampling groove 31 is completely exposed to the reactor and the outside of the sealing connector 1.

[0035] In some embodiments of the utility model, the sealing gland 12 is separated from the sampling lever 2 by a rotary clamping method.

[0036] In some embodiments of the utility model, the front part of the sampling rotary handle 2 is provided with an opening cavity that can contain the sealing gland 12, and the inner wall of the opening cavity is provided with several radial limit parts 21 at intervals; The outer wall interval of the sealing gland 12 is provided with a number of radial clamp parts 122, the radial clamp part 122 corresponds to the radial limit part 21-a, and when the sampling screw 2 is in the locked position, the radial clamp part 122 is limited between the radial limit part 21 and the bottom surface of the opening cavity, the two surfaces of the radial clamp part 122 are respectively with the radial limit part 21 and the opening cavity The bottom surface is tightly attached to prevent the sealing gland 12 from the opening cavity

Pop out. This embodiment shows only one connection, and the connection between the sampling handle 2 and the sealing gland 12 is not limited to the above.

[0037] In some embodiments of the utility model, the inner walls of the first sampling rod jack 111 and the second sampling rod jack 121 are smooth, and a sealing filler 14 is filled in the sealing cavity, and the sealing filler 14 is graphite ceramic, tetrafluor, EPDM and other fillers. The sampling rod 3 is sealed with the sealing connector 1 through the surrounding sealing packing, so that the sampling rod is always tightly sealed with the sealing connector 1 during the movement, which can effectively avoid the pressure change in the reactor caused by sampling.

[0038] In some embodiments of the utility model, the connecting seat 11 comprises a connecting part 101 and a fixed ring 102 arranged on the connecting part 101, the center of the connecting part 101 is provided with a first sampling rod jack 111, and the outer wall of the connecting part 101 is in the shape of a step; The fixing ring 102 is arranged on the outside of the connecting part 101, and is connected with the annular step surface on the outer wall of the connecting part 101, and the connecting part 101 is connected with the reactor through the fixing ring 102. Fixed ring 102 can be installed on the side wall of the bottom head of the reactor by bolts, welds, quick-opening and other forms.

[0039] In some embodiments of the utility model, the connecting part 101 is inserted into the reactor 4, the fixing ring 102 is installed on the side wall of the bottom head of the reactor by bolts, and a sealing washer is arranged between the fixing ring 102 and the reactor to maintain the seal between the connecting seat and the reactor 4.

[0040] A plurality of material sampling notches 31 May be provided on the sampling rod 3. In this embodiment, a material sampling groove is provided in the middle of the sampling rod 3. The material sampling groove can be in various forms such as circle, ellipse, waist shape, etc. In this embodiment, the material sampling groove adopts waist shape structure.

[0041] The inner diameter of the first sampling rod jack 111 and the second sampling rod jack 121 are equal, and the outer diameter of the sampling rod 3 is slightly smaller than the size of the first sampling rod jack 111, so that the sampling rod 3 can move freely in the first sampling rod jack 111.

[0042] In some embodiments of the utility model, the front end of the sampling rod 3 is provided with a front end limit ring 32 convex along the radial direction; The front end of the connecting part 101 is provided with a limit bevel 113 fitted with the side wall of the front end limit ring 32.

[0043] The front end limit ring 32 can be conical, circular arc and other forms, in the utility model, the front end limit ring 32 is a reverse cone surface limit ring. The front end limit ring 32 is integrated with the front end of the sampling rod 3. The inverted cone of the front limit ring 32 fits the annular cone of the limit bevel 113. The inverted cone of the front limit ring 32 is fitted to the annular cone of the limit bevel 113 at the sampling location to prevent the sampling rod from swaying off the central axis and from slipping out of the sealed connector 1.

[0044] The sampling lever 2 is symmetrically provided with a handle 22. The handle 22 May be a straight handle for sampling operation. The sampling handle 2 and the sampling rod 3 can be connected by bolt, welding, quick opening and other forms. In the utility model, the sampling handle 2 is fixed and connected with the back end of the sampling rod 3 by a bolt.

[0045] In some embodiments of the utility model, the front face of the sealing gland 12 is provided with a splice part 123, and the splice part 123 is inserted into a ring gap between the cavity 112 and the sampling rod 3.

[0046] During the normal reaction of the high viscosity material, when the material is not required to be measured, the sampling rod 3 is inserted forward into the reactor 4, the sampling lever 2 is in the locked position, and the radial clamp 122 on the sealing gland 12 is tightly confined between the radial limit 21 of the sampling lever 2 and the bottom surface of the open cavity. At this time, the sealing gland 12 is confined in the open cavity, and the material on the sampling rod 3 is sampled Groove 31 completely falls into the reactor, because the sampling rod 3 and sealed connector 1, sealed connector 1 and the bottom head of the reactor are sealed well between, so that the reaction environment of the whole reactor will not be disturbed; If it is necessary to detect high-viscosity materials in the reactor, rotate the sampling lever 2, and after the radial clamp 122 on the sealing gland 12 is released between the radial limit 21 of the sampling lever 2 and the bottom of the open cavity, pull out the sampling rod 3 from the reactor until the sampling groove 31 on the sampling rod 3 is completely exposed to the reactor and the outside of the sealed connector 1. At this time, the sampling lever 2 is removed from the locking position

Change of sample position; Because the sealing packing 14 is filled in the sealing chamber, the sampling rod 3 is always well sealed with the sealing connector 1 during the whole movement process, so as to maintain the tightness in the reactor during the sampling process; After sampling and testing the high-viscosity material in the material sampling groove 31, the operation is reversed until the sampling lever 2 is re-converted from the sampling position to the locking position to complete the sampling.

[0047] In this embodiment, the high viscosity material is sucrose fatty acid ester, sucrose fatty acid ester is an excellent non-ionic surfactant, because of its excellent emulsification, thickening, dispersion, lubrication and other properties, so that it has important applications in food, medicine, industrial fermentation, pesticides, synthetic resins, sugar production, textile additives, oil fields and other fields. When synthesized by solvent-free method, the material viscosity is large, the reaction temperature is high, and it needs to be carried out in a high vacuum state. Sucrose fatty acid ester reaction synthesis, reaction temperature 120-140°C, vacuum -0.095Mpa above, up to the established required time, the material thickens, without destroying the vacuum, maintain the reaction condition, rotate the sampling handle 2, out of the limit, pull out the sampling rod 3 until the front limit ring 32 and limit Angle 113 fit. At this time, the sampling rod 3 is completely pulled out, the material sampling groove 31 is completely exposed to the outside of the reactor and the sealed connector 1, the material in the groove is scraped out to achieve sampling, the sampling rod 3 is pushed back, the sampling rod is extended forward, and the material sampling groove 31 is immersed in the material and filled with material. If you need to increase the amount of sampling, you can repeat the above action many times, push back after sampling, reverse rotation card back sealing gland 12 of the radial card attachment 122 and sampling handle 2 of the radial limit part 21 can be, the whole process is convenient and fast, and will not affect the vacuum environment in the reactor, can be in the vacuum reaction system, without destroying the vacuum, for the viscous material sampling, in order to monitor the reverse Should, speed up the progress, avoid contact oxidation decomposition, moisture absorption and so on.

[0048] Notwithstanding that embodiments of the invention have been shown and described above, it is understood that the embodiments are exemplary and cannot be construed as limitations of the invention, and that persons of ordinary skill in the art may vary, modify, replace, and variant the embodiments within the scope of the invention.

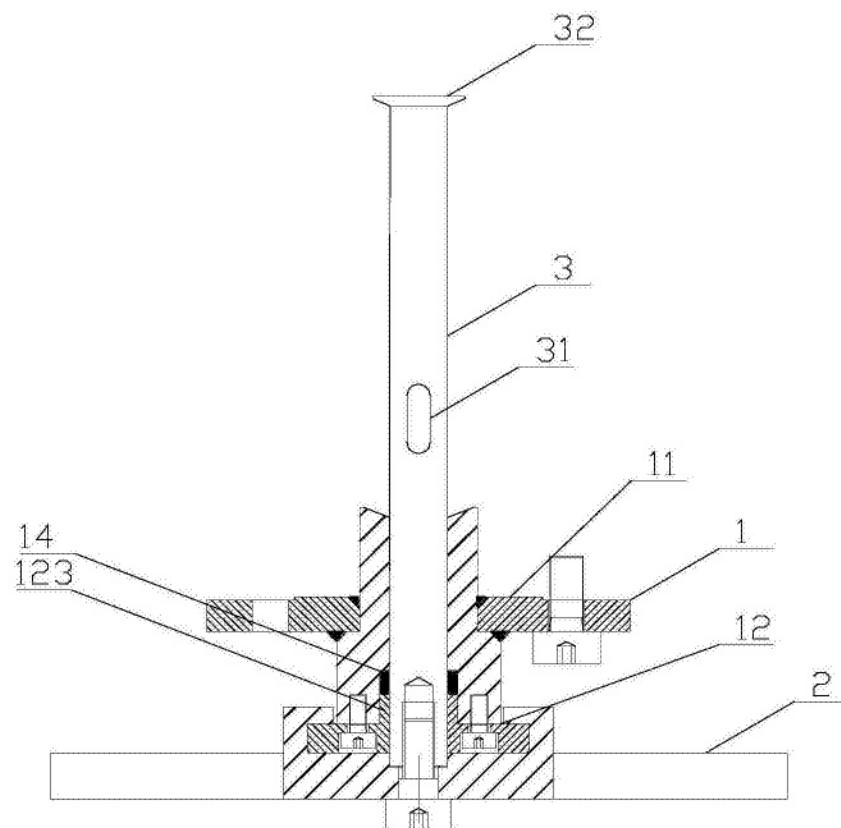


图1

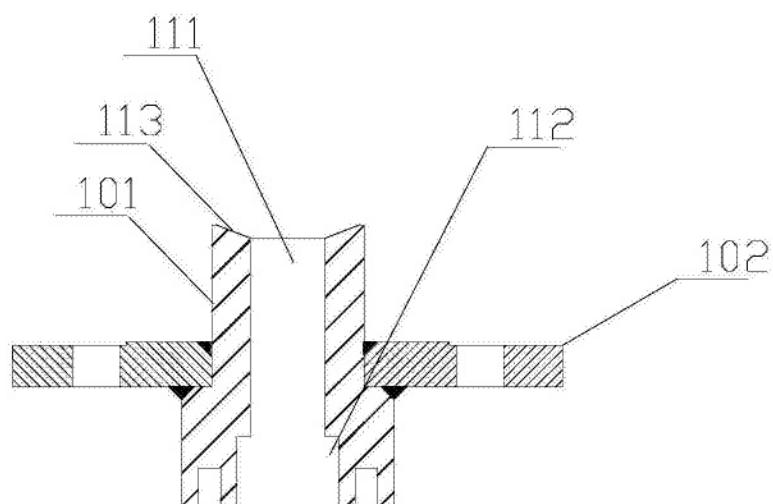


图2

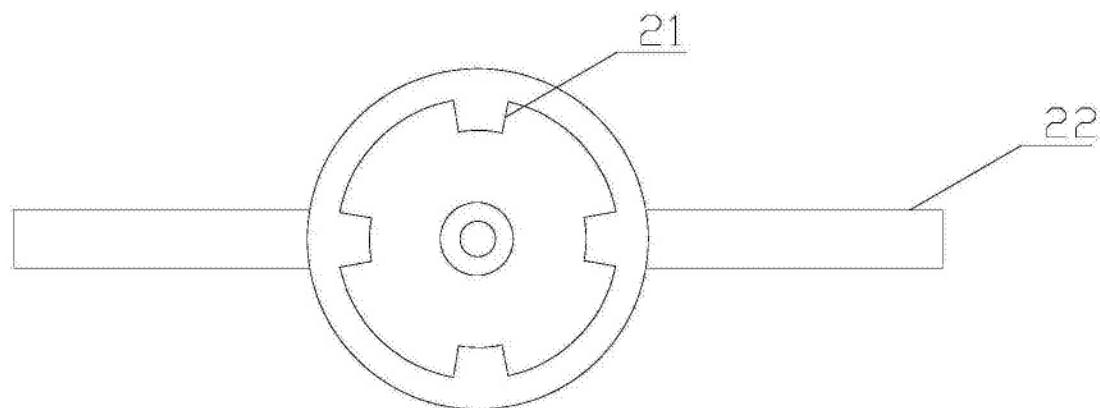


Figure 3

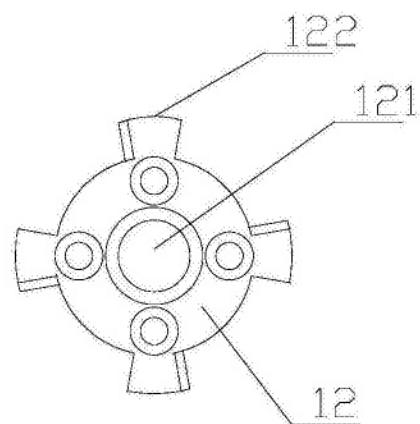


Figure 4

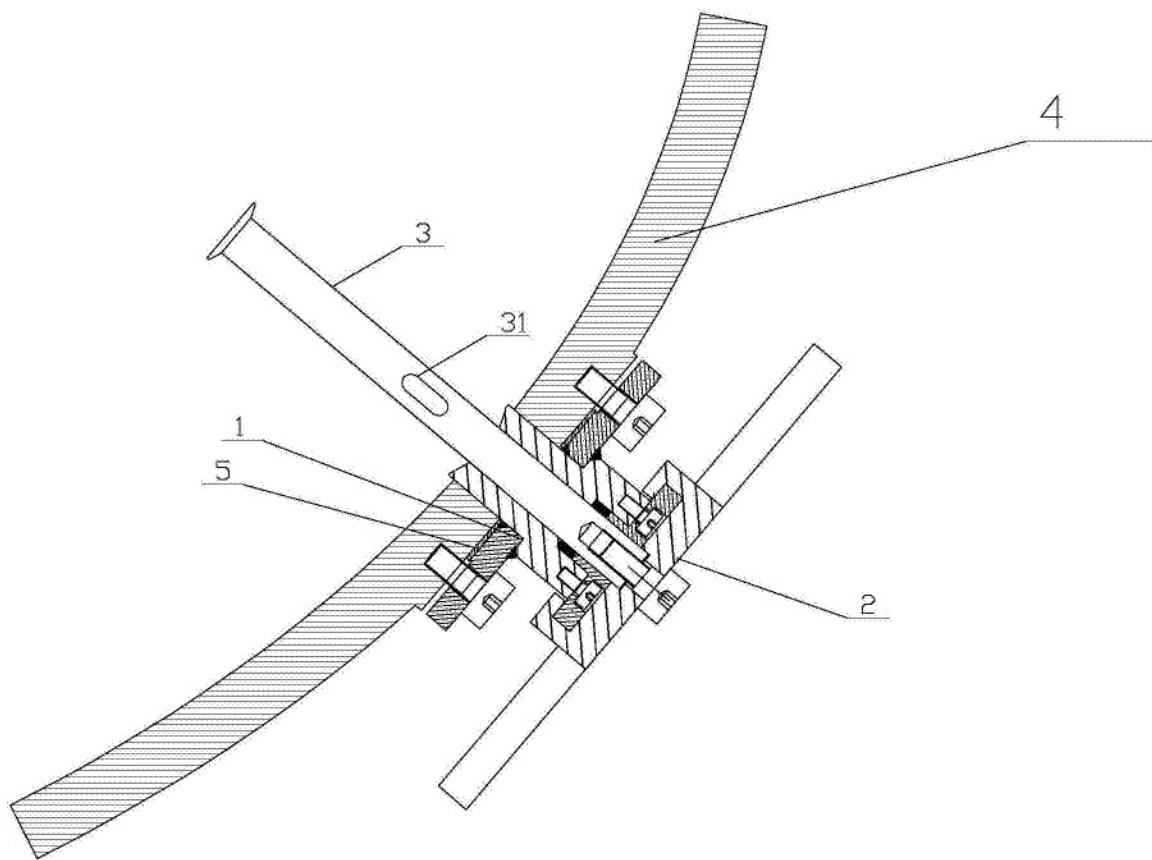


Figure 5

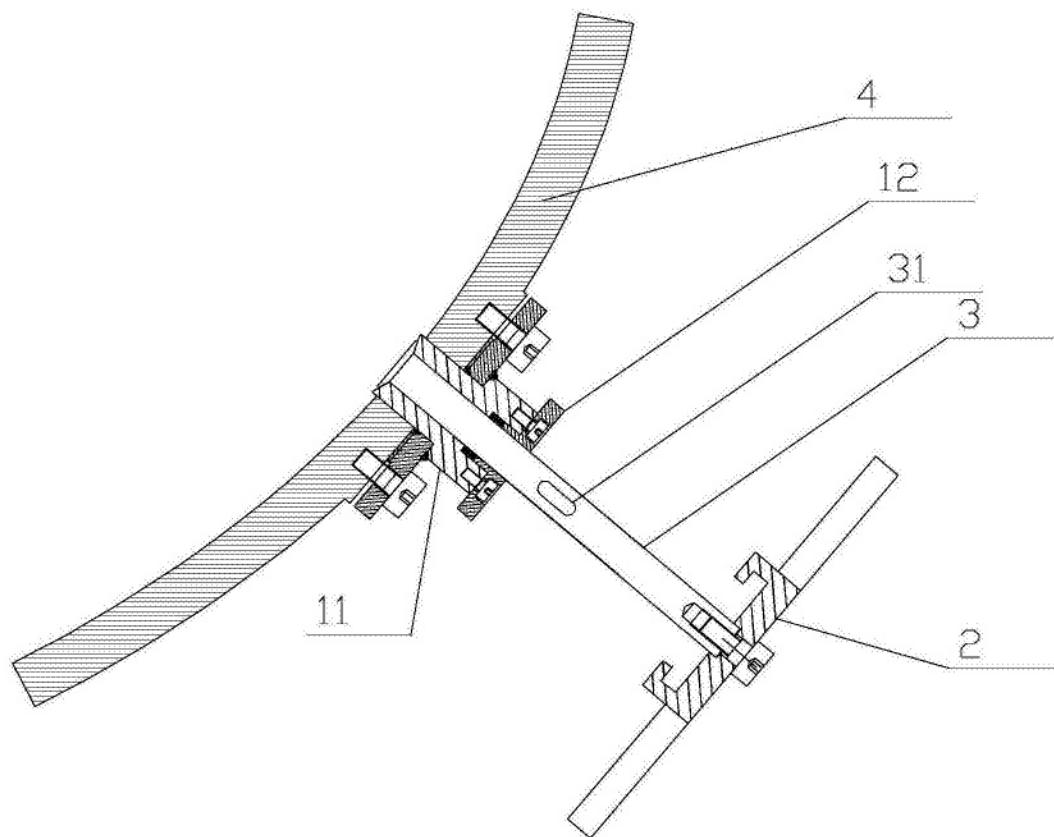


Figure 6



(12) Utility model patent

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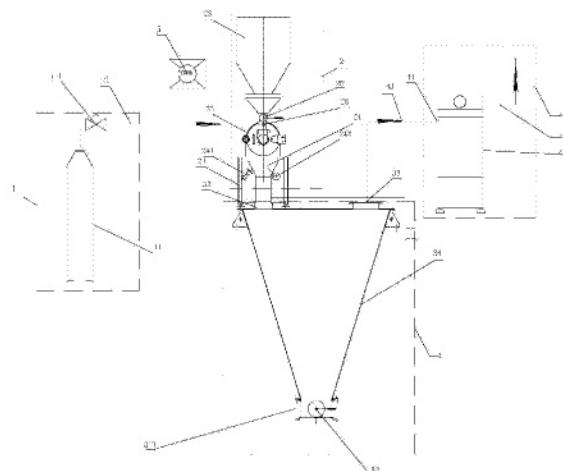
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(54) Name of the utility model

- A powder beating mechanism with a forced cooling function

(57) Abstract

The utility model discloses a powder making mechanism with forced cooling function, which comprises a cooling device, a powder making machine, a silo and an air extraction and dust removal device; The pulverizing machine comprises a frame and a crushing mechanism arranged on the frame, the top feed port of the crushing mechanism is connected with the feed bin, the bottom discharge port is connected with the discharge bin, the top feed port of the crushing mechanism is provided with a feed regulating valve and a cooling medium inlet, wherein the cooling medium inlet is communicated with the cooling device pipeline: The silo is arranged at the bottom of the powder mill, the bottom of the silo is provided with a discharge port, the top of the silo is provided with a feed port and an air pumping port, the feed port is connected with the discharge silo pipe of the powder mill; The air extraction port is communicated with the pipeline of the air extraction and dust removal device. The utility model has the advantages that the heat generated in the crushing process of the material with low melting point can be removed in time to ensure that the temperature of the material is lower than the melting point, to maintain brittleness and to achieve the target powder particle size.



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1. A powder making mechanism with forced cooling function is characterized in that it comprises a cooling device (1), a powder making machine (2), a silo (3) and an air extraction and dust removal device (4);

The grinding machine (2) comprises a frame (21) and a crushing mechanism (22) arranged on the frame (21), the top feed port of the crushing mechanism (22) is connected with the feed bin (23), the bottom discharge port is connected with the discharge bin (24), the top feed port of the crushing mechanism (22) is provided with a feed regulating valve (25) and a cooling material inlet (26). Wherein the cooling medium inlet (26) is connected with the cooling device (1) pipeline;

The silo (3) is arranged under the powder mill (2), including the silo body (34), the bottom of the silo body (34) is provided with a discharge port (31), the top of the silo body (34) is provided with a feed port (32) and an air extraction port (33), the feed port (32) is connected with the discharge bin (24) pipeline of the powder mill (2); The air extraction port (33) is communicated with the air extraction and dust removal device (4) pipeline.

2. As described in claim 1, a powder making mechanism with forced cooling function is characterized in that the cooling device (1) comprises a liquid nitrogen tank (11) and a cooling medium connection pipe (12), and the liquid nitrogen tank (11) is equipped with a liquid nitrogen decompression regulating valve (111); One end of the cooling medium connection pipe (12) is connected with the mouth of the liquid nitrogen tank (11) through the liquid nitrogen pressure regulator (111), and the other end is connected with the cooling medium inlet (26) of the crushing mechanism (22).

3. As described in claim 1, a powder mechanism with a forced cooling function is characterized in that the powder machine (2) is a universal mill, an air mill, a hammer mill or an ultrafine mill.

4. As a powder mechanism with a forced cooling function described in claim 1, it is characterized in that the discharge bin (24) is provided with a sampling port and a detection port, wherein the sampling port is equipped with a sampling valve (241) and the detection port is equipped with a thermometer (242).

5. As a powder mechanism with forced cooling function described in claim 1, it is characterized in that the bin body (34) is an inverted conical structure, and the discharge valve (311) is equipped with the discharge port (31) at the bottom of the bin body (34).

6. A powder mechanism with a forced cooling function as described in claim 1 is characterized in that the air extraction dust removal device (4) is a cyclone separation tower or air extraction filter dust removal device.

· A powder mechanism with forced cooling function as described in claim 1 is characterized in that the air extraction dust removal device (4) includes a dust removal mechanism body (45), and the upper part of the dust removal mechanism body (45) is provided with an air inlet (41) and an exhaust port (42). The air intake port (41) is connected with the air extraction port (33) of the bin (3) through the intake pipe (43), and the outer end of the exhaust port (42) is connected with the dust removal rear empty pipe (44).

8. As described in any one of the claims 1~7, a powder mechanism with forced cooling function is characterized in that it also includes a number of oxygen content detection alarms (5), and the oxygen content detection alarm (5) is arranged near the bunker (3).

- with a strong |) can beat powder mechanism

Technical fields

[0001] The utility model relates to a powder beating mechanism with forced cooling function, which belongs to the crushing technical field of chemical industry, pharmaceutical industry, etc.

Background technology

[0002] In the fields of fine chemical industry and pharmaceutical industry, crushing and crushing of materials are often involved. The crushing equipment of conventional materials can be universal mill, air mill, hammer mill, ultrafine mill and other conventional crushing equipment. According to the particle size of the mill, it can be divided into coarse crusher, mill, ultrafine mill. Crushing process applied to the solid external force shear, impact, rolling, grinding four kinds. Shear is mainly used in coarse crushing and crushing operation is suitable for ductile or fiber materials and large pieces of crushing or crushing operation impact is mainly used in crushing operation is suitable for brittle materials crushing is mainly used in high fineness crushing ultrafine crushing operation is suitable for most properties of materials for ultrafine crushing operation grinding is mainly used for ultrafine crushing or super large crushing equipment is suitable for crushing The further crushing operation after the operation. The actual crushing process is often several external forces acting simultaneously. However, some materials have a low melting point, the brittleness of the crushing process is reduced, and the properties of instability under heat conditions can not be well crushed. Due to the high speed collision between materials and equipment, materials and materials during the crushing process, the temperature of materials and equipment rises, resulting in material melting, adhesion, large powder particles and uneven particles, and ideal powder results can not be obtained.

Content of the invention

[0003] Aiming at the problems of the prior art, the utility model provides a powder making mechanism with the function of forced cooling, which can cool the material in the crushing process, prevent the material from melting and bonding, and have good powder making effect.

[0004] The utility model relates to a powder making mechanism with forced cooling function, which is characterized in that it comprises a cooling device, a powder making machine, a bin and a suction and dust removal device;

[0005] the grinding machine comprises a frame and a crushing mechanism arranged on the frame, the top feed port of the crushing mechanism is connected with the feed bin, the bottom discharge port is connected with the discharge bin, the top feed port of the crushing mechanism is provided with a feed regulating valve and a cooling medium inlet, wherein the cooling medium inlet is communicated with the cooling device pipeline;

[0006] the silo is arranged under the powder machine, including the silo body, the bottom of the silo body is provided with a discharge port, the top of the silo body is provided with a feed port and an air pumping port, the feed port is connected with the discharge bin pipeline of the powder machine; The air extraction port is communicated with the pipeline of the air extraction and dust removal device.

[0007] Further, the cooling device comprises a liquid nitrogen tank and a cooling medium connection pipe, and the mouth of the liquid nitrogen tank is equipped with a liquid nitrogen decompression regulating valve; One end of the cooling medium connection pipe is connected with the mouth of the liquid nitrogen tank through the liquid nitrogen pressure regulator, and the other end is connected with the inlet of the cooling medium of the crushing mechanism.

[0008] Further, the mill is a universal mill, an air mill, a hammer mill or an ultrafine mill and other conventional crushing equipment.

[0009] Further, the discharge bin does not have a sampling port and a detection port, in which the sampling port is equipped with a sampling valve, and the detection port is equipped with a thermometer.

[0010] Further, the silo is an inverted conical structure, and the discharge valve is arranged at the bottom of the silo.

[0011] Further, the exhaust dust removal device is a cyclone separation tower or a exhaust filter dust removal device.

[0012] Further, the air extraction dust removal device comprises a dust removal mechanism body, the upper part of the dust removal mechanism body is provided with an air inlet and an exhaust port, the air inlet is communicated with the air extraction port of the bin through the intake pipe, and the outer end of the exhaust port is connected with the dust removal rear empty pipe.

[0013] The powder making mechanism with the forced cooling function of the utility model also comprises a number of oxygen content detection alarms, the oxygen content detection alarm is arranged near the bunker.

[0014] The utility model is suitable for mixing powder of materials with low melting point. This kind of material is easy to melt and bond due to mechanical collision and heating in the process of powder beating, the powder particles are too large and the particles are not uniform, and the ideal powder beating result cannot be obtained.

[0015] The utility model has the advantages that the heat generated in the crushing process of the material with low melting point can be removed in time to ensure that the temperature of the material is lower than the melting point, to maintain brittleness and to achieve the target powder particle size.

Illustrative drawings

[0016] Figure 1 is a structure diagram of the utility model.

Specific implementation mode

[0017] The specific embodiments of the present invention are described in detail in combination with the attached drawings. It should be understood that the specific embodiments described herein are only used to illustrate and explain the embodiments of the invention and are not used to limit the embodiments of the invention.

[0018] It should be noted that embodiments and features in embodiments of the invention may be combined with each other without conflict.

[0019] In the description of the invention, it is to be understood that the terms "center," "longitudinal," "transverse," "length," "width" "Thickness" and "up", "down", "before" and "after", "left", "right" and "vertical", "level", "top", "bottom" "inside", "outside", "clockwise" and "rotate", "axis", "radial" and "to" indicates a location or position relations based on the location or position shown in the appended drawings, only is to facilitate the description of this invention and Jane The device or element referred to in the description, rather than the indication or implication, must have a specific orientation, be constructed and operated in a specific orientation, and therefore cannot be understood as a limitation of the invention.

[0020] Furthermore, the terms "first" and "second" are used for descriptive purposes only and are not to be understood as indicating or suggesting relative importance or as implicitly indicating the quantity of the technical features indicated. Thus, a feature qualified as "first" or "second" may explicitly or implicitly include at least one of those features. In the description of the present invention, "multiple" means at least two, such as two, three, etc., unless otherwise expressly and specifically qualified.

[0021] In the present invention, unless otherwise expressly specified and qualified, the terms "mounting", "connecting", "fixed", etc. shall be understood broadly, for example, may be fixed connections, may be detachable connections, or may be integrated; It may be a mechanical connection or an electrical connection or can communicate with each other; It can be directly connected, or indirectly connected through an intermediate medium, and it can be a connection within two components or an interaction between two components, unless otherwise expressly defined. For persons of ordinary skill in the art, the specific meaning of the above terms in the present invention may be understood according to the circumstances.

[0022] In the present invention, unless expressly specified and qualified otherwise, the first feature "above" or "below" the second feature may be the first and second feature in direct contact, or the first and second feature in indirect contact through an intermediate medium. Furthermore, where the first feature is "above", "above" and "above" the second feature, the first feature is directly above or diagonally above the second feature, or merely indicates that the first feature is at a higher level than the second feature. The first feature being "below", "below" and "below" the second feature can mean that the first feature is directly or diagonally below the second feature, or simply that the first feature is less horizontal than the second feature.

[0023] In the description of this specification, the reference terms "an embodiment", "some embodiments", "examples", "specific examples", or "some examples", etc., refer to a specific feature, structure, material or characteristic described in conjunction with the embodiment or example

Points are contained in at least one embodiment or example of the present invention. In this specification, schematic representations of the above terms need not be directed to the same embodiment or example. Furthermore, the specific features, structures, materials or features described may be combined in an appropriate manner in any one or more embodiments or examples. In addition, without contradicting each other, persons skilled in the art may combine and combine the different embodiments or examples described in this specification and the features of different embodiments or examples.

[0024] The invention is described in detail below by reference to the attached drawings and in conjunction with exemplary embodiments.

[0025] The utility model relates to a powder making mechanism with forced cooling function, which comprises a cooling device 1, a powder making machine 2, a silo 3 and an air extraction and dust removal device 4;

[0026] The grinding machine 2 comprises a frame 21 and a crushing mechanism 22 arranged on the frame 21, the top feed port of the crushing mechanism 22 is connected with the feed bin 23, the bottom discharge port is connected with the discharge bin 24, the top feed port of the crushing mechanism 22 is provided with a feed regulating valve 25 and a cooling medium inlet 26, wherein the cooling medium inlet 26 is connected with the cooling device 1 pipeline Pass;

[0027] the silo 3 is arranged under the powder mill 2, including the silo body 34, the bottom of the silo body 34 is provided with a discharge port 31, the top of the silo body 34 is provided with a feed port 32 and an air pumping port 33, the feed port 32 is communicated with the discharge bin 24 pipeline of the powder mill 2; The air extraction port 33 is communicated with the air extraction and dust removal device 4 pipeline.

[0028] In some embodiments of the utility model, the cooling device 1 comprises a liquid nitrogen tank 11 and a cooling medium connecting pipe 12, and a liquid nitrogen reducing regulating valve 111 is arranged at the mouth of the liquid nitrogen tank 11; One end of the cooling medium connecting pipe 12 is connected with the mouth of the liquid nitrogen tank 11 through the liquid nitrogen reducing regulating valve 111, and the other end is connected with the cooling medium inlet 26 of the crushing mechanism 22. When in use, the flow of liquid nitrogen can be controlled by regulating the liquid nitrogen decompression regulating valve 111.

[0029] In some embodiments of the utility model, the powder mill 2 is a universal mill, an air mill, a hammer mill or an ultrafine mill and other conventional crushing equipment.

[0030] In some embodiments of the utility model, the discharge bin 24 is provided with a sampling port and a detection port, in which sampling 1 is equipped with sample 241, and the temperature 242 is equipped at the inspection port for sampling and detecting the powder particle size distribution and monitoring the material temperature, guiding the liquid nitrogen flow adjustment, the speed of the powder machine, the feeding speed and other parameters of the powder.

[0031] In some embodiments of the utility model, the bin body 34 is an inverted conical structure, which is convenient for discharging, and the discharging valve 311 is arranged at the discharging port 31 at the bottom of the bin body 34, which can control the discharging of the bin.

[0032] In some embodiments of the utility model, the air extraction dust removal device 4 is a cyclone separation tower or a air extraction filter dust removal device.

[0033] In some embodiments of the utility model, the air extraction dust removal device 4 is arranged above the bunker 3, the air extraction dust removal device 4 comprises a dust removal mechanism body 45, the upper part of the dust removal mechanism body 45 is provided with an air intake port 41 and an exhaust port 42, the air intake port 41 is communicated with the air extraction port 33 of the bunker 3 through the intake pipe 43, and the outer end of the exhaust port 42 is connected with the dust removal rear air pipe 44 , the gas extracted in the bin can be dusted and filtered.

[0034] The powder making mechanism with the forced cooling function also comprises a plurality of oxygen content detection alarm 5, the oxygen content detection alarm 5 is arranged near the bunker 3, can detect the oxygen content in the air near the bunker.

[0035] application example

[0036] Sucrose stearate softening point 45~48°C.

[0037] Open the air extraction dust removal device 4, oxygen content detection alarm 5, powder machine 2, liquid nitrogen pressure control valve 111, the powder machine 2 fan group 30-B pre-cooling 3~5 minutes. Start feeding the powder from the feed bin 23 of the powder beater 2 and carry out the powder beating. Sampling from the sampling port of the discharge bunker 24 to monitor the granularity of the material, and through the thermometer 242 to monitor the temperature of the material after pulverizing at 30~35°C, and adjust accordingly

Liquid nitrogen inlet speed, 10~20ml/ min. After the powder is finished, the particle size of the material after sampling and crushing is 250~300 mesh. [0038] Ratio:

[0039] sucrose stearate softening point 45~48°C

[0040] Open the air extraction and dust removal device 4. Powder beater 2 Fan Group 30-B. Start feeding from the powder beater 2's feed bin 23 for powder beating. Sample from the sampling port to monitor the particle size of the material, and through the thermometer 242 to monitor the temperature of the material after the powder is 40~43°C. After 10 minutes of pulverizing, the temperature of the material rises to 46~48°C. The powder mixer 2 is overheated and automatically stops. The sampling found that the material appeared adhesion, caking, black particles and other phenomena.

[0041] Although embodiments of the invention have been shown and described above, it is understood that the embodiments are exemplary and cannot be construed as limitations of the invention, and that persons of ordinary skill in the art may vary, modify, replace, and variant the embodiments within the scope of the invention.

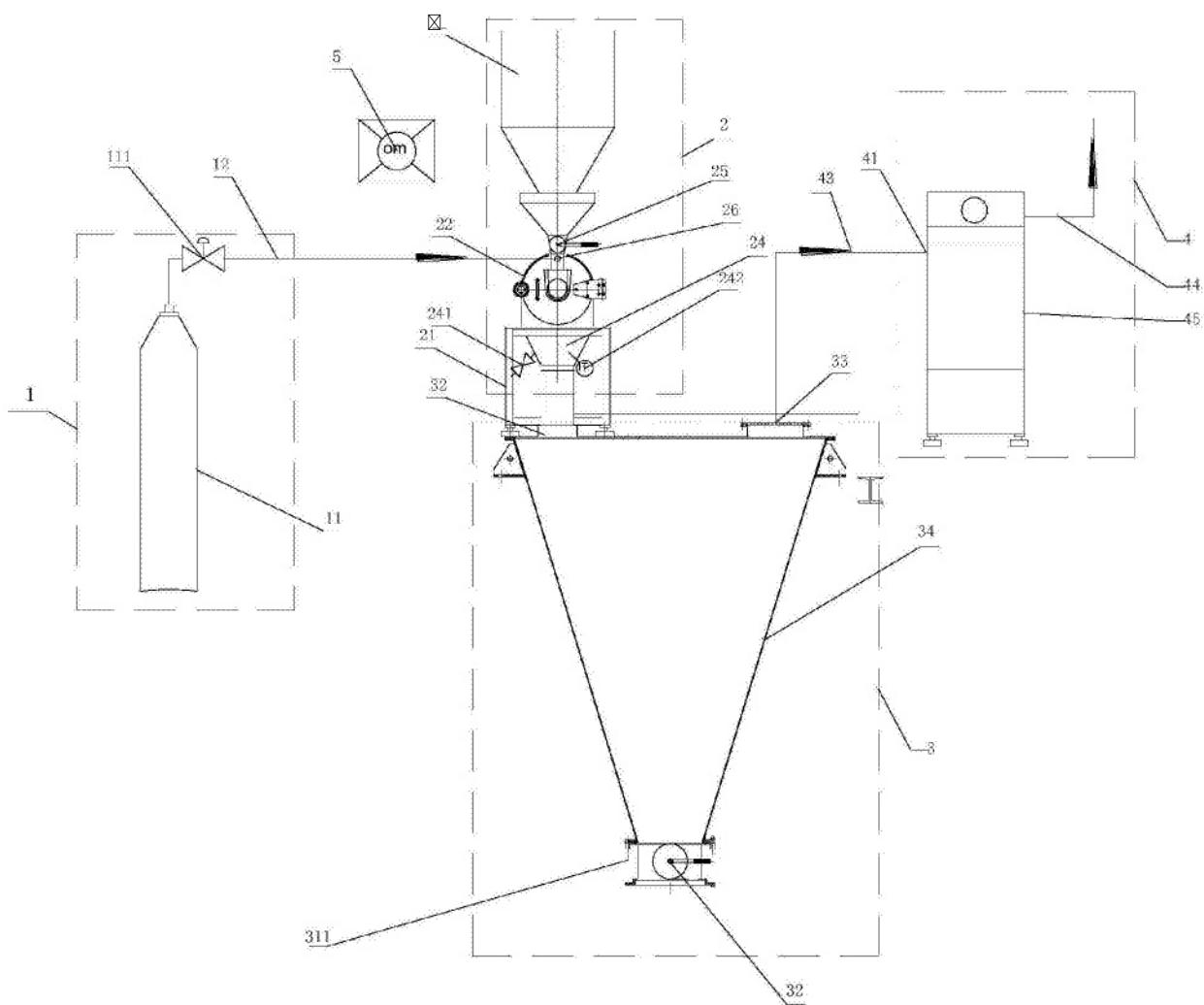


Figure 1



(12) Utility model patent

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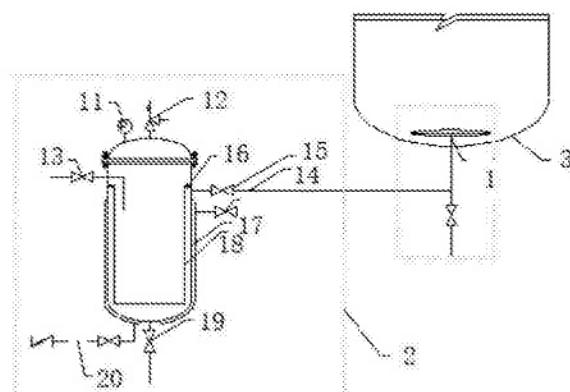
权利要求书1页 说明书3页 附图2页

(54) Name of the utility model

A residual solvent removal device

(57) Abstract

The utility model discloses a residual solvent removal device comprising an air bag and a distributor, which are connected with an air bag and a distributor through a pressure pipe, and the distributor is arranged at the bottom of an inner cavity of a distillation device, and pores are arranged on the distributor, and the direction of pores is toward the bottom or side of the interior of a distillation device: The gas bag comprises a cylinder body, the upper end of the simplified is provided with an upper head, the upper head is installed with a pressure gauge for monitoring the gas pressure in the cylinder and a safety valve; The simplified body is provided with at least one material inlet allowing steam or gas to enter the cylinder and the steam or gas to leave the simplified body of the material outlet, the opening position of the material inlet is higher than the opening position of the material outlet, the material inlet and the material outlet are respectively connected with the inlet pipe and the outlet pipe. The utility model is applicable to a vacuum or atmospheric pressure distillation system. After evaporating most of the solvent, the residual solvent in the material can be further removed after nitrogen or water vapor is passed into the utility model.



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1. A residual solvent removal device is characterized in that it comprises an air bag and a distributor, the air bag is connected with the distributor through a pressure pipe, the distributor is arranged at the bottom of the chamber of the distillation device, the distributor is provided with a porosity, the porosity is opened in the direction of the distillation device internal bottom or side;

The gas bag comprises a cylinder, the upper end of the simplified is provided with an upper head, the upper head is installed with a pressure gauge for monitoring the gas pressure in the cylinder and a safety valve; The simplified body is provided with at least one material inlet allowing steam or gas into the simplified body and allowing steam or gas to leave the simplified body outlet, the opening position of the material inlet is higher than the opening position of the material outlet, the material inlet and the material outlet are respectively connected with the inlet pipe and the outlet pipe, the inlet pipe extends into the cylinder, the outlet pipe and distribution The stomata of the device is connected;

The inner part of the cylinder is provided with a detachable filter for removing foreign matter in the steam and gas, and a gap is left between the bottom of the detachable filter and the bottom of the simplified; The inlet pipe is arranged on the inside of the detachable filter screen, and the outlet pipe is arranged on the outside of the detachable filter screen;

The bottom of the cylinder is provided with a drain port and a drain port, the drain port and the drain port are respectively connected with a drain pipe and a drain pipe, the drain pipe is installed on the drain valve, the drain pipe is installed on the drain valve.

2. As described in claim 1, a residual solvent removal device is characterized in that the distributor adopts a ring, a row of pipes or a star shape.

3. A residual solvent removal device, as described in claim 1, is characterized in that the pores are perforated or sintered metal plates.

A residual solvent removal device, as described in claim 1, is characterized in that an inlet valve and an outlet valve regulating the amount of steam gas in and out are installed in the inlet pipe and the outlet pipe E

5. As any one of the residual solvent removal devices described in claim 1 to 4, it is characterized in that the outer wall of the cylinder is provided with a jacket, and the jacket is provided with a jacket inlet.

- Kind of residual device

Technical field

[0001] The utility model belongs to the distillation technical field of chemical industry, oil processing, pharmaceutical industry, etc., in particular relates to a residual solvent removal device

Background technique

[0002] In the fields of fine chemical industry and pharmaceutical industry, solvent switching is often required in the process of reaction and post-treatment. The residue of the previous solvent will not only cause cross-contamination of the solvent system, but also sometimes lead to the failure of the subsequent reaction and post-treatment process. In addition, for liquid products, it also involves the control of the solvent residue of the final product, which is often PPM level, the use of conventional distillation equipment usually can not meet the process requirements, can use water vapor distillation device.

[0003] At present, the conventional water vapor distillation device is usually the steam pipeline into the distillation tank, so that the steam and the material contact, so that the components to be distilled out, to achieve the purpose of water vapor distillation. For example, CN203370308U describes a kind of water vapor distillation tank, which increases the steam inlet pipe at the bottom of the distillation tank, and the steam outlet is equipped with a steam distributor to increase the steam dispersion effect in the material and achieve the purpose of improving the water vapor distillation effect.

[0004] The use of water vapor distillation device effectively increases the mixing effect of steam and material, improve the distillation effect, but the lack of flow control device; In addition, the water vapor system inevitably carries a small amount of foreign bodies, which can not be tolerated if they are brought into the product.

Content of invention

[0005] In order to solve the above technical problems existing in the prior art, the utility model provides a residual solvent removal device. For some unstable materials in the presence of high temperature and water, the utility model adopts nitrogen as the entailing medium to effectively remove the residual water in the materials, so as to facilitate subsequent operations or produce products with low water content.

[0006] The technical scheme adopted by the utility model is:

[0007] A residual solvent removal device is characterized in that it comprises an air bag and a distributor, the air bag is connected with the distributor through a pressure pipe, the distributor is arranged at the bottom of the inner cavity of the distillation device, the distributor is provided with a porosity, the porosity is opened in the direction of the distillation device internal bottom or side;

[0008] the gas packet comprises a simplified, the upper end of the simplified is provided with an upper head, the upper head is installed for monitoring the gas pressure in the cylinder body pressure gauge and safety valve; The simplified tube is provided with at least one material inlet allowing steam or gas into the simplified tube and allowing steam or gas to leave the simplified tube outlet, the opening position of the material inlet is higher than the opening position of the material outlet, the material inlet and the material outlet are respectively connected with the inlet pipe and the outlet pipe, the inlet pipe extends into the simplified tube, the outlet pipe and the distribution The stomata of the device is connected;

[0009] the inner part of the cylinder is installed with a detachable filter for removing foreign matter in the steam and gas, and a gap is left between the bottom of the detachable filter and the bottom of the simplified; The intake pipe is arranged on the inside of the detachable filter screen, and the outlet pipe is arranged on the outside of the detachable filter screen;

[0010] The bottom of the cylinder is respectively provided with a drain port and a drain port, the drain port and the drain port are respectively connected with a drain pipe and a drain pipe, the drain pipe is installed on the drain valve, the drain pipe is installed on the drain valve.

[0011] Further, the distributor adopts a ring, a row of pipes or a star shape.

[0012] Further, the pores are perforated or sintered metal plates.

[0013] Further, the inlet pipe and the outlet pipe are respectively provided with an inlet valve and an outlet valve for regulating the inlet and outlet of steam or gas.

[0014] Further, the outer wall of the cylinder body is provided with a jacket, and the jacket is provided with a jacket inlet.

[0015] Compared with the prior art, the utility model has the following advantages:

[0016] 1. The utility model is applicable to a vacuum or atmospheric distillation system. After evaporating most of the solvent, the device can be used to further remove the residual solvent in the material by injecting nitrogen or water vapor.

[0017] 2. For some unstable materials at high temperature and in the presence of water, the utility model adopts nitrogen as the entailing medium to effectively remove the residual water in the material, so as to facilitate subsequent operation or the production of low water content products.

Illustration with drawings

[0018] Figure 1 is a schematic diagram of the overall structure of the utility model.

[0019] FIG. 2a, FIG. 2b and FIG. 2c are respectively structural diagrams of three different forms of the gas distributor of the utility model.

Specific implementation mode

[0020] The specific embodiments of the utility model are described in detail in combination with the attached drawings. It should be understood that the specific embodiments described herein are only used to illustrate and explain the embodiments of the utility model and are not used to limit the embodiments of the utility model.

[0021] It should be noted that the embodiments of the utility model and the features in the embodiments can be combined with each other, provided that there is no conflict.

[0022] The utility model is described in detail by reference to the attached drawings and combined with exemplary embodiments.

[0023] Referring to FIG. 1 and FIG. 2c, a residual solvent removal device of the utility model comprises an air bag 2 and a distributor 1, the air bag 2 is connected with the distributor 1 through a pressure pipe, the distributor 1 is arranged at the bottom of the inner cavity of the distillation device 3, the distributor 1 is provided with a porosity 21, the porosity 21 is opened in the direction of the distillation device 3 internal bottom or side;

[0024] the gas packet 2 comprises a cylinder, the upper end of the simplified is provided with an upper head, the upper head is installed with a pressure gauge 11 for monitoring the gas pressure in the simplified and a safety valve 12; The cylinder is provided with at least one allowing steam or gas into the simplified material inlet 13 and allow steam or gas to leave the simplified material outlet 15, the opening position of the material inlet is higher than the opening position of the material outlet, the material inlet and the material outlet are respectively connected with the inlet pipe and the outlet pipe 14, the inlet pipe extends into the simplified internal, out The port pipe 14 is connected with the stomata 21 of the distributor 1;

[0025] the inner part of the cylinder is provided with a detachable filter screen 18 for removing foreign matter in the steam and gas, and a gap is provided between the bottom of the detachable filter screen 18 and the bottom of the simplified tube; The intake pipe is arranged on the inside of the detachable filter screen 18, and the outlet pipe 14 is arranged on the outside of the detachable filter screen 18; The upper end face of the detachable filter screen 18 is provided with a tetrafluorogasket 16

[0026] The bottom of the cylinder is respectively provided with a drain port 20 and a drain port 19, the drain port and the drain port are respectively connected with a drain pipe and a drain pipe, the drain pipe is installed on the drain valve, the drain pipe is installed on the drain valve.

[0027] In one embodiment, the distributor 1 adopts the shape of a ring, a row pipe or a star.

[0028] In one embodiment, the stomata 21 adopts a perforated or metal sintered plate mode.

[0029] In one embodiment, an inlet valve and an outlet valve for regulating the amount of steam or gas in and out are respectively installed on the inlet line and the outlet line 14.

[0030] In one embodiment, a jacket 17 is arranged on the outer wall of the cylinder, and a jacket inlet is arranged on the jacket.

[0031] The utility model adopts a light stabilizer UV-3853, and most of the solvent is recovered after post-treatment. In order to further remove the residual organic solvent, the utility model device is used for treatment, and the residual solvent and water are further removed. The specific operation is as follows:

[0032] The distillation reactor is heated to 110~135°C, the vacuum is pulled to more than -0.095MPa, and the vapor distillation inlet valve is opened. When the pressure gauge of the air bag is 0.15~0.2MPa, the air valve is opened, and the water vapor is fully contact and mixed with UV-3853 materials in the reactor through the distributor, and the residual organic solvent is enlivened and steamed out. Half an hour later, the solvent residue of UV-3853 was detected by sampling. After detection, the solvent residue before treatment was 128ppm, and the solvent residue after treatment was 3.7ppm

[0033] The utility model is used for the removal of methyl oleate from sucrose oleate. Because sucrose oleate is easy to decompose in the high-temperature water-containing system, nitrogen is adopted as the entraining medium to remove methyl oleate. Another beneficial effect of nitrogen as the entraining medium is to reduce the oxygen content in the system and inhibit the oxidation reaction of sucrose oleate. The specific operation is as follows:

[0034] The distillation reactor is heated to 90~125°C, the vacuum is pulled to -0.095MPa or above, and the nitrogen inlet valve is opened. When the pressure gauge of the air bag is 0.15~0.2MPa, the air valve is opened, and the nitrogen is fully in contact with the sucrose oleate material in the reactor through other distributors, and then the residual methyl oleate and oleic acid are steamed out. 3 hours later, take samples for testing. After detection, the residue of methyl oleate and oleic acid was 6.5% before treatment, and the residue was reduced to 1.7% after treatment.

[0035] Although embodiments of the utility model have been shown and described above, it can be understood that the embodiments are exemplary and cannot be construed as limitations of the utility model, and that the embodiments may be changed, modified, replaced and modified by ordinary technicians in the field within the scope of the utility model.

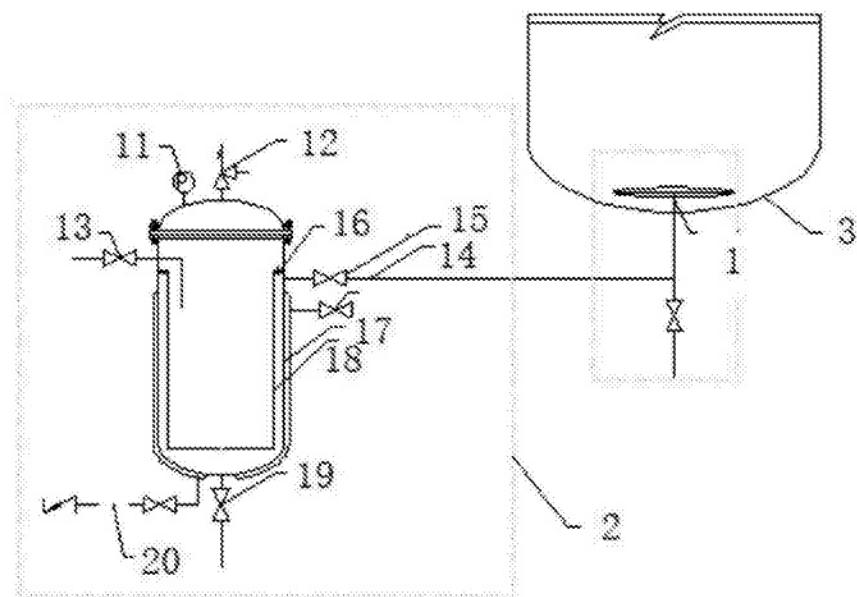


FIG. 1

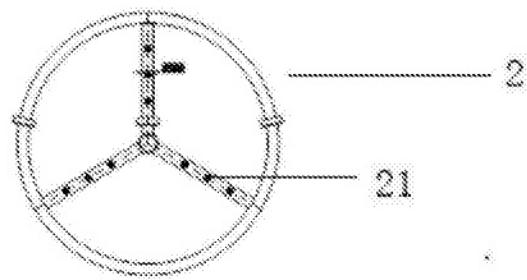


Figure 2a

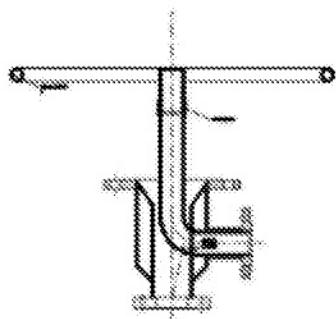


Figure 2b

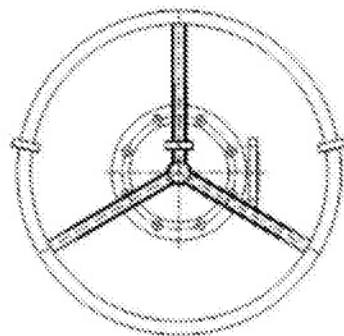


Figure 2c



(12) Utility model patent

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33201

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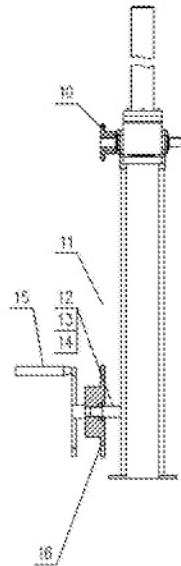
权利要求书1页 说明书2页 附图2页

(54) Name of the utility model

- Plant supernatant hydraulic material device

(57) Abstract

The utility model discloses an overcleaning hydraulic material device, which comprises a material pressing rod, a worm wheel screw lift, a hand wheel assembly, a chain and a flange plate. The pressure rod is fixed on a reaction kettle body or a tank body through the flange plate; The screw of the worm wheel screw lift is connected with the press rod, and the worm wheel screw lift is provided with a transmission rod, and the transmission rod is provided with a first sprocket; The handwheel assembly comprises a handwheel, a drive shaft and a second sprocket, the second sprocket set on the drive shaft, the handwheel and the drive shaft one end of the rotation connection, the two ends of the chain are set on the first sprocket and the second sprocket, the rotation of the handwheel through the chain drive the worm wheel screw lift screw up and down movement, Thereby adjusting the pressure bar and supernatant liquid level height. The utility model has the advantages of simple structure, low cost and easy availability, can effectively and quickly transfer materials, improves production capacity and eliminates safety hidden



1. The supernatant hydraulic material device comprises a press rod, which is characterized in that the press rod also comprises a worm wheel screw lift, a hand wheel assembly, a chain and a flange plate. The press rod is fixed on the reactor body or tank body through the flange plate; The screw of the worm wheel screw lift is connected with the press rod, the worm wheel screw lift worm wheel is provided with a transmission rod, the transmission rod is provided with a first sprocket; The handwheel assembly comprises a handwheel, a drive shaft and a second sprocket, the second sprocket set on the drive shaft, the handwheel and the drive shaft one end of the rotation connection, the two ends of the chain are set on the first sprocket and the second sprocket, the rotation of the handwheel through the chain drive the worm wheel screw lift screw up and down movement, so as to adjust the pressure rod and supernatant liquid surface high The degree.

2. The supercleaning hydraulic material device described in claim 1 is characterized in that it also comprises a casing, and the lower end of the screw of the worm wheel screw lift is connected with the press rod through one port of the joint, and the other port of the joint is connected with a threaded elbow.

3. As a supercleaning hydraulic material device described in claim 2, the feature is that the lower end of the sleeve is fixed on the flange plate, the flange plate is set on the pressing rod, the pressing rod and the flange plate is arranged between the O ring.

4. As a supernatant hydraulic material device described in claim 2, it is characterized that the second sprocket is assembled on the drive shaft through the bearing, the bearing is installed in the bearing hole opened in the center of the second sprocket, and the bearing hole is provided with a limited position of the spring.

- Kind of E cleaning hydraulic material device

Technical fields

[0001] The utility model belongs to the technical field of chemical equipment, in particular relates to a supercleaning hydraulic material device.

Background technology

[0002] In the actual production of chemical industry, due to the production process needs to take the sizing process, after the sizing, standing stratification, separation of supernatant.

[0003] At present, the supernatant is often separated by vacuum absorbing supernatant. This operation mode has great safety and process risks and is not advisable. In order to improve the operation and realize the safe, fast and efficient separation of supernatant, it is necessary to adopt appropriate devices to solve the safety problems existing in vacuum suction supernatant.

Content of invention

[0004] In order to solve the above technical problems existing in the prior art, the utility model provides an overcleaning hydraulic material device. The utility model can quickly transfer the upper solvent or water layer to other reaction kettle or tank for use, and can adjust the height of different liquid levels according to the actual production situation, press the supernatant completely as far as possible, improve the solid-liquid separation effect, and realize the safe, rapid and efficient separation of the supernatant.

[0005] The technical scheme adopted by the utility model is:

[0006] A supercleaning hydraulic material device comprises a press rod, which is characterized in that the press rod also comprises a worm wheel screw lift, a hand wheel assembly, a chain and a flange plate. The press rod is fixed on the reaction kettle body or tank body through the flange plate; The screw of the worm wheel screw lift is connected with the press rod, and the worm wheel screw lift is provided with a transmission rod, and the transmission rod is provided with a first sprocket; The handwheel assembly comprises a handwheel, a drive shaft and a second sprocket, the second sprocket set on the drive shaft, the handwheel and the drive shaft one end of the rotation connection, the two ends of the chain are set on the first sprocket and the second sprocket, the rotation of the handwheel through the chain drive the worm wheel screw lift screw up and down movement, so as to adjust the pressure rod and supernatant liquid surface high The degree.

[0007] Further, also comprises a casing, the lower end of the screw of the worm wheel screw lift is connected with the press rod through one port of the joint, and the other port of the joint is connected with a threaded elbow.

[0008] Further, the lower end of the sleeve is fixed on the flange plate, the flange plate is set on the pressing rod, the pressing rod and the flange plate is arranged between the O ring.

[0009] Further, the second sprocket is assembled on the drive shaft through the bearing, the bearing is installed in the bearing hole opened in the center of the second sprocket, and the bearing hole is provided with a limited clamping spring.

[0010] Further, the material of the press bar can be made of various materials that do not react with the corrosion of the supernatant.

[0011] Further, the length and inner diameter of the press rod are determined by the actual situation.

[0012] Compared with the prior art, the utility model has the following advantages:

[0013] 1. The utility model skillfully adds a worm wheel screw lift, a hand wheel, a chain and a flange piece to the press bar, which has the advantages of simple structure, low cost and easy availability;

[0014] 2. The utility model quickly and practically transfers the supernatant liquid of the material, avoids the problems that affect the production capacity such as turning kettle and pipeline plugging, accelerates the production speed, reduces the cost and increases the profit;

[0015] 3. The utility model adopts inert gas pressing operation, avoiding the problems of open cap suction, electrostatic accumulation and disorganized discharge of dangerous solvent, etc., and eliminating the hidden danger of safety.

Illustration with drawings

[0016] Figure 1 is an embodiment of a supercleaning hydraulic material device of the utility model.

[0017] FIG. 2 is a local structure diagram of the utility model.

Specific implementation mode

[0018] The specific embodiments of the present invention are described in detail in combination with the attached drawings. It shall be understood that this

The specific embodiments described in the premises are used only to illustrate and explain embodiments of the invention and are not used to limit embodiments of the invention. [0019] It should be noted that the embodiments of the invention and the features in the embodiments may be combined with each other, provided that there is no conflict.

[0020] The invention is described in detail below by reference to the attached drawings and in conjunction with exemplary embodiments.

[0021] Referring to FIG. 1 and FIG. 2, the utility model relates to a supercleaning hydraulic material device, which comprises a press rod, a worm wheel screw lift 1, a handwheel assembly, a chain 11 and a flange plate 5. The press rod 4 is fixed on the reaction kettle body or tank body through the flange plate 5; The screw of the worm wheel screw lift 1 is connected with the press rod 4, and the worm wheel screw lift is perforated with a transmission rod, and the transmission rod is provided with a first sprocket 10; The handwheel assembly comprises the handwheel 15, the drive shaft 14 and the second sprocket 16, the second sprocket 16 set on the drive shaft 14, the handwheel 15 and the drive shaft 14 one end rotation connection, the two ends of the chain 11 are set on the first sprocket 10 and the second sprocket 16, the rotation of the handwheel 15 through the chain 11 drive the worm wheel screw up and down. The screw of the machine moves up and down, so as to adjust the height of the press rod 4 and the supernatant liquid surface.

[0022] Further, a casing 2 is also included, and the lower end of the screw of the worm wheel screw lift is connected to the press rod 4 through a port of the joint 7, and the other end of the joint 7 is connected with a threaded elbow 3.

[0023] Further, the lower end of the sleeve 2 is fixedly arranged on the flange plate 5, the flange plate 5 is arranged on the pressing rod 4, the pressing rod 4 and the flange plate 5 is arranged between the O ring 6.

[0024] Further, the second sprocket 16 is assembled on the drive shaft 14 through bearing 12, and the bearing 12 is installed in the bearing hole opened in the center of the second sprocket 16, and the bearing hole is provided with a limited position clip spring 13.

[0025] Further, the material of the press rod 4 can be made of various materials that do not react with the corrosion of the supernatant.

[0026] Further, the length and inner diameter of the press rod 4 are determined by the actual situation.

[0027] When the utility model is used, the press rod is fixed on the cover of the conventional reaction kettle with a flange piece, and after the material is statically separated, nitrogen is poured into the reaction kettle to transfer the material layer to other equipment through the press rod. With the decline of the feed liquid, the press rod is slowly moved down by turning the hand wheel until the press is stopped after the interface layer, and the solvent or water is drawn into the reaction kettle again, as described above. Methods The pressing operation is carried out again until the material extraction or water washing is complete, and the supernatant is transferred completely.

[0028] Although embodiments of the invention have been shown and described above, it is understood that the embodiments are exemplary and cannot be construed as limitations of the invention, and that the embodiments may be varied, modified, replaced, and modified by persons of ordinary skill in the art within the scope of the invention.

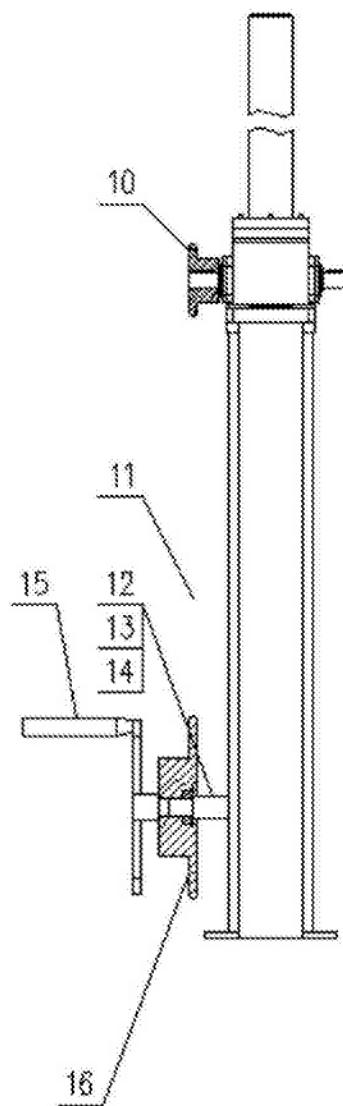


FIG. 1

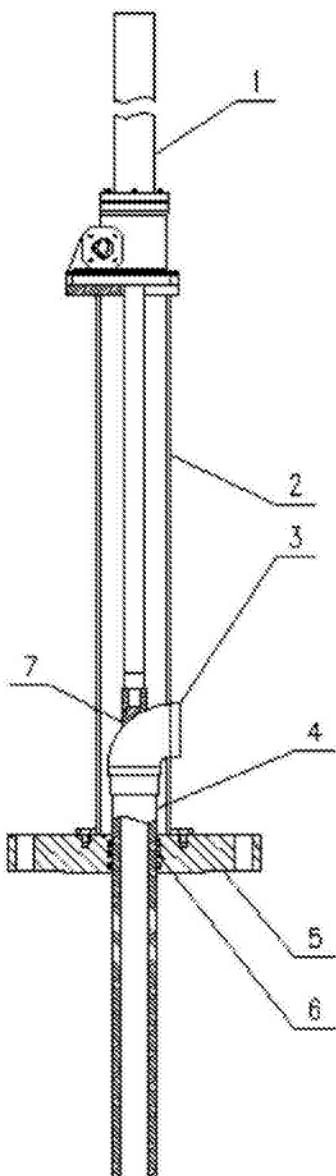


Figure 2



(12) Application for invention patent

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(43) Please EKB 2021.04.30

Application No. 201910973179.1

(22) Application B 2019.10.14

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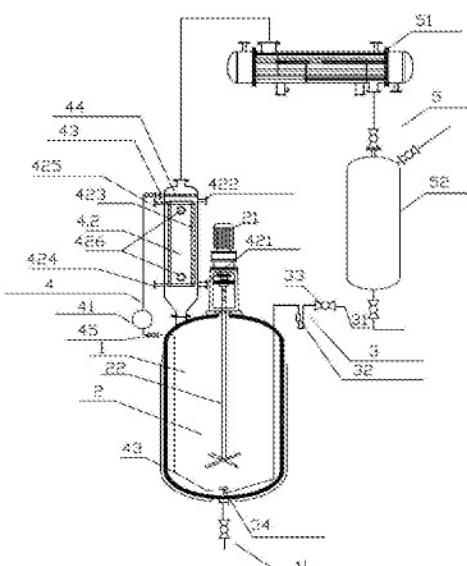
权利要求书2页 说明书6页 附图1页

(54) Name of invention

The invention relates to a preparation method and equipment for hindered amine light stabilizer

(57) Abstract

A preparation method and equipment for hindered amine light stabilizer, the method comprises the following steps: The piperidol, organic acid ester and catalyst are added to the reaction vessel, the heat preservation reaction is carried out at 80~150°C, and then distilled to no alcohol is evaporated under the condition of -0.05~-0.10MPa, and then the inert gas flow is passed through the gas distributor, the temperature of the system is controlled at 80~150°C, and the pressure of the system is controlled to continue the heat preservation reaction until the end of the reaction. Then the reaction liquid was transferred out, and the product was obtained after post-treatment; During the reaction, the sublimed piperidol enters the recycling system to continue to participate in the reaction; The apparatus comprises: reaction vessel; The material collection tank is arranged on the top of the reaction container for collecting sublimed materials; The material circulation system is used to bring the sublimed material back to the reaction vessel; The stirring device is arranged on the top of the reaction vessel, and the stirring part of the stirring device extends into the reaction vessel from the mounting hole; Inert gas supply unit; By-product recovery device and vacuum system. The invention has the advantages that the reaction process does not require solvent, is green and environmentally friendly, the reaction is thorough, the raw material utilization rate is high, the obtained alcohol content is high and can be used as by-products,



1. A method for preparing a hindered amine light stabilizer is characterized in that the method comprises the following steps:

1) the piperidol, organic acid ester and catalyst are mixed to carry out heat preservation reaction at 80~150°C, and partially generated alcohol is steamed out, wherein the piperidol is 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol; The organic acid ester is the ester formed by C8-C20 fatty acid, sebacic acid or benzoic acid and low molecular weight alcohol; The low molecular weight alcohol is methanol, ethyl ester or isopropyl ester; The catalyst is titanate;

2) Control the temperature in the reaction vessel is 80~150°C, the pressure is -0.05~-0.10MPa, and then the generated alcohol is steamed out

3) The inert gas is passed into the reaction vessel, and the temperature in the reaction vessel is controlled to be 80~150°C, the pressure is -0.10~0.10MPa, the pressure can be from negative pressure to 1Kg positive pressure, and the reaction can be kept warm until the reaction is complete; The material after the reaction is washed and dried to obtain the hindered adhesive light stabilizer. During the reaction process, the sublimated piperidol is recovered and re-introduced into the reaction vessel to participate in the reaction.

2. As described in claim 1, the preparation method of hindered amine light stabilizer is characterized in that no additional solvent is added to entrainment low molecular weight alcohols during the reaction process, but in step 3) inert gas is used to entrainment low molecular weight alcohols to promote the equilibrium movement of the reaction and promote the complete reaction.

3. The preparation method of a hindered amine light stabilizer as described in claim 1 is also characterized in that during the reaction process, sublimed piperidol is collected and reintroduced into the reaction vessel to participate in the reaction.

· The preparation method of a hindered amine light stabilizer as described in claim 1 is characterized in that the ratio of the amount of piperidol to the organic acid ester ester based substance is 1~1.2:1.

· The preparation method of a hindered amine light stabilizer as described in claim 1 is characterized in that the catalyst is tetramethyl titanate, tetraethyl titanate, tetraisopropyl titanate, tetrabutyl titanate, isoamyl titanate, diethyl titanate, and the mass dosage of the catalyst is 0.05%~10% of the weight of the organic acid ester.

· The preparation method of a hindered adhesive light stabilizer as described in claim 1 is characterized in that: Step 3) the inert gas flow through is nitrogen.

· The equipment constructed according to the preparation method of a hindered amine light stabilizer described in any of the claims 1 to 6 is characterized in that it includes:

The reaction container has a reaction chamber, the top is provided with a material circulation port and a mounting hole, the bottom is provided with a liquid outlet, used to transfer the material from the reaction container; The stirring device is arranged on the top of the reaction container, and the stirring part of the stirring device extends into the reaction container from the mounting hole for stirring the material into the reaction chamber;

The inlet end of the inert gas supply unit is communicated with the external inert gas source pipeline, and the outlet end is introduced into the bottom of the reaction vessel for introducing inert gas into the reaction vessel;

And the recycling and recovery system, the feed port is connected with the pipeline at the bottom of the reaction vessel, and the discharge port is connected with the material distributor in the collection tank, which is used to recycle the materials in the recovery tank into the reaction chamber of the reactor.

8. As the equipment described in claim 7, it is characterized by: the recycling system includes a circulation pump, collection tank, material connecting pipe, material distributor and material flow control valve, the liquid inlet end of the circulation pump is connected with the material pipe extending into the bottom of the reaction container, the liquid outlet end of the circulation pump is introduced through the pipeline to the top of the collection tank, and the material distribution set in the top of the collection tank The device is connected and used to inject materials into the collection tank; The outlet of the collection tank is connected with the pipeline of the material circulation port at the top of the reaction container, which is used to re-inject the material in the collection tank into the reaction container.

· The equipment described in claim 8 is characterized in that the outer layer of the collection tank is a jacketed structure, wherein the jacket is provided with a jacketed cooling heating material inlet and a jacketed cooling heating medium outlet, and the jacket cooling heating medium inlet and the jacket cold

However, the outlet of the heating medium is connected with the inner cavity of the jacket, which is used to pour the medium into the jacket to cool or heat the jacket; The collection tank is provided with a number of columns with fins, fin column cooling heating medium inlet, pipe cooling heating medium outlet are extended to the outside of the collection tank, used to pour the medium into the fin to cool or heat the fin; The upper and lower parts of the collection tank are respectively provided with an observation port.

- A hindered condenser light stabilized E is prepared

Technical field

[0001] The invention relates to a preparation method and equipment for hindered amine light stabilizer, belonging to the production field of chemical supplies.

Background technology

[0002] In the prior art, one of the common methods for the synthesis of low molecular weight hindered amine light stabilizer is: transesterification reaction of 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol and organic acid ester in organic solvent under the action of catalyst, and the generated alcohol is taken out by the way of distillation solvent, and the balance is moved to make the reaction complete. The organic acids include fatty acids, malvacic acid, benzoic acid, butane tetracarboxylic acid, etc. The esters are methyl ester and ethyl ester; The catalyst is titanate catalyst, sodium methanol, dibutyl tin oxide and so on. The titanate catalyst has tetraisopropyl titanate, tetrabutyl titanate, isoamyl titanate, diethyl titanate and supported titanate catalyst, etc. The organic solvent is octane, dimethyl, oil ether and other solvents.

[0003] China patent (CN103274994A) the inhibitor 701 (that is, 2, 2, 6, 6-tetramethylpiperidol nitrogen oxide free radical) and methyl stearate in the titanate catalyzed, reaction in the n-octane, and by steaming out the n-octane methanol, after treatment products. The Chinese patent (CN101665457A) uses 2,2,6, 6-tetramethylpiperidol and dimethyl sebacate as raw materials, and dibutyltin oxide as catalyst for the reaction in xylene. The Chinese patent (CN101768104B) uses 1,2,2,6, 6-5. Methylpiperidol and dimethyl sebacate were used as raw materials, and titanate supported by activated carbon was used as catalyst to react in petroleum ether. The Chinese patent (CN101774963B) uses 2,2,6, 6-tetramethylpiperidol and fatty acid methyl ester as raw materials, titanate and other catalysts to react in alkanes and cycloalkanes solvents such as n-octane to prepare the corresponding light stabilizer. The Chinese patent (CN101774963B) also uses the n-octane alkane and cycloalkane as the solvent to promote the reaction by reflux methanol separation.

[0004] The defects of the prior art are :1, the organic solvents used are flammable and volatile solvents, which will inevitably increase the safety hazards and the emission of unorganized gases in the use process, increase the environmental protection risks and treatment costs, and the solvent loss will also cause the production cost to increase. 2, because the methanol generated during the reaction process has a certain solubility in the organic solvent, the methanol must be removed as far as possible before the solvent is applied to ensure a better use effect, which also increases the post-treatment operation and cost. The methanol obtained from the reaction can not be effectively used. 3. Due to the sublimation of 2, 2, 6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol, it is easy to sublime in the process of reaction, solvent distillation and recovery, which leads to the blockage of the distillation pipeline, affecting the evaporation of methanol from the reaction system, and then affecting the equilibrium movement of transesterification reaction, and the degree of reaction is low. 4. Pipeline blockage also leads to the reduction of solvent distillation rate, and a large amount of solvent remains in the system. 5. Sublimation of 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol also resulted in the reduction of raw material utilization efficiency and the increase of raw material consumption when feeding.

Contents of invention

[0005] Problems such as solvent loss, environmental pollution, safety hazards, post-treatment of solvent before application due to the use of organic solvent for prior art; At the same time, due to the raw material 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol due to its easy sublimation properties, pipeline blockage will affect the distillation of alcohol and solvent distillation, resulting in a low reaction degree, high solvent residue rate in the system, 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol and other raw materials. The invention provides a preparation method of hindered amine light stabilizer and a device for the problem that the material can not be fully utilized. The invention has a reaction process that is not required

It has the advantages of solvent, green environmental protection, thorough reaction, high utilization rate of raw materials, high alcohol content obtained and can be used as by-products, simple production process and convenient operation.

[0006] The invention relates to a preparation method of hindered amine light stabilizer, which is characterized in that the method comprises the following steps:

[0007] 1) The mixture of piperidol, organic acid ester and catalyst was carried out at 80~150°C for heat preservation reaction, and part of the alcohol was steamed out; The piperidol is 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol; The organic acid ester is an ester formed by C8~C20 fatty acid, sebacic acid or benzoic acid and low molecular weight alcohol; The low molecular weight alcohol is methanol, ethyl ester or isopropyl ester. The catalyst is a titanate ester

[0008] 2) Control the temperature in the reaction vessel to 80~150°C, pressure to -0.05~-0.10MPa, and further steam out the generated alcohol;

[0009] 3) The inert gas is passed into the reaction vessel, and the temperature in the reaction vessel is controlled to be 80~150°C and the pressure is -0.10~-0.10MPa, and the reaction is kept warm until the reaction is complete. After the reaction, the material is washed and dried to obtain the hindered amine light stabilizer. During the reaction process, the sublimated piperidol is recovered and re-introduced into the reaction vessel to participate in the reaction.

[0010] In the process of reaction, no additional solvent was added to entrainment low molecular weight alcohols, but in step 3) inert gas was used to entrainment low molecular weight alcohols to promote the equilibrium movement of the reaction and promote the complete reaction.

[0011] During the reaction, sublimed piperidol is collected and reintroduced into the reaction vessel to participate in the reaction.

[0012] The ratio of the amount of the piperidol to the organic acid ester based substance is 1~1.2:1.

[0013] The catalyst is tetramethyl titanate, tetraethyl titanate, tetraisopropyl titanate, tetrabutyl titanate, isoamyl titanate, diethyl titanate, and the mass dosage of the catalyst is 0.05%~10% of the weight of the organic acid ester.

[0014] The temperature of step 1)~3) is preferably 100~140°C.

[0015] A device constructed according to a preparation method of hindered amine light stabilizer described in the invention is characterized in that:

[0016] A reaction vessel is provided with a reaction chamber, the top is provided with a material circulation port and a mounting hole, and the bottom is provided with a liquid outlet, which is used to transfer materials from the reaction vessel; The inert gas supply unit, the intake end is connected with the external inert gas source pipeline, the outlet end is introduced into the bottom of the reaction vessel, used to introduce inert gas into the reaction vessel;

[0017] and the recycling and recovery system, the feed port is connected with the pipeline at the bottom of the reaction vessel, and the discharge port is connected with the material distributor in the collection tank, which is used to recycle the material in the recovery tank into the reaction chamber of the reactor.

[0018] The recycling system comprises a circulating pump, a collection tank, a material connecting pipe, a material distributor and a material flow control valve. The liquid inlet end of the circulating pump is connected with the material pipe extending into the bottom of the reaction vessel. The liquid outlet end of the circulating pump is introduced into the top of the collection tank through a pipeline, and is connected with the material distributor arranged on the top of the collection tank for injecting materials into the collection tank; The outlet of the collection tank is connected with the pipeline of the material circulation port at the top of the reaction container, which is used to re-inject the material in the collection tank into the reaction container.

[0019] The outer layer of the collection tank is a jacket type structure, wherein the jacket is provided with a jacket cooling heating medium inlet and jacket cooling heating medium outlet, jacket cooling heating medium inlet and jacket cooling heating medium outlet are communicated with the jacket cavity, used to pour cooling or heating medium into the jacket to cool or heat the jacket; The collection tank is provided with a number of columns with fins, fin column cooling heating medium inlet, pipe cooling heating medium outlet are extended to the outside of the collection tank, used to pour cooling or heating medium into the fin to cool or heat the fin; The upper and lower parts of the collection tank are respectively provided with an observation port.

[0020] The recycling material inlet of the collection tank is located at the upper part of the collection tank, and the recycling material inlet is provided with a material division

The feeding port of the material distributor is communicated with the discharging port pipe of the material connecting pipe.

[0021] The material connecting pipe is provided with a control valve for controlling the flow rate of the material.

[0022] The stirring device comprises a stirring motor and a stirring paddle. The stirring motor is arranged at the top of the reaction vessel, the stirring paddle holder is arranged at the mounting hole of the reaction vessel, and the output shaft of the stirring motor is connected with the upper end of the stirring paddle, and the lower end of the stirring paddle is extended through the mounting hole into the reaction chamber of the reaction vessel for stirring the material loaded into the reaction chamber.

[0023] The inert gas supply unit comprises an inert gas intake pipe, a gas flow meter, a gas control valve and a gas distributor. The intake end of the inert gas intake pipe is communicated with the external inert gas gas source. The outlet end of the inert gas intake pipe extends from the top of the reaction vessel along the inner wall into the bottom of the reaction chamber, and is connected with the gas distributor arranged at the bottom of the reaction chamber to distribute the inert gas into the reaction chamber; The gas flowmeter and gas volume control valve are arranged on the inert gas intake pipe for controlling the flow rate of inert gas.

[0024] Also comprises a by-product collection system, the by-product collection system comprises a condenser and a by-product collection tank, the air inlet of the condenser is connected with the air outlet pipe at the top of the collection tank, the liquid outlet of the condenser is connected with the liquid inlet pipe of the by-product collection tank, which is used to condense the by-product escaped from the top of the collection tank into the by-product collection tank.

[0025] The top of the by-product collection tank is provided with a vent hole that can be communicated with the inner cavity, and the vent hole is communicated with the external vacuum system pipeline through a vacuum tube, which is used to adjust the pressure in the by-product collection tank.

[0026]

The pipe connecting the inlet and outlet of the by-product collection tank is equipped with a control valve.

[0027] The invention has the advantages that the reaction process does not require solvent, is green and environmentally friendly, the reaction is thorough, the raw material utilization rate is high, the obtained alcohol content is high and can be used as by-products, the production process is simple and the operation is convenient.

Illustrations are attached.

[0028] Figure 1 is a structure diagram of the invention.

Specific embodiments

[0029] The invention is further explained in conjunction with the attached drawings.

[0030] Refer to the attached drawings:

[0031] Embodiment 1: 2,2,6, 6-tetramethylpiperidol 345.8Kg (2.2kmol), dimethyl sebacate 230.3Kg (1 kmol), catalyst tetraisopropyl titanate 2.84Kg (0.01mol) in the reaction vessel. Temperature was raised to 120~125°C for heat preservation reaction, the control system pressure was -0.05~-0.100MPa, the alcohol generated by distillation reaction to basically no evaporation. Open the vacuum to make the system vacuum to -0.098MPa. Then the gas distributor passes into the nitrogen gas flow, and the temperature of the system is controlled at 120~125°C to continue the heat preservation reaction. 2,2,6, 6-tetramethylpiperidol sublimed during the reaction was collected in a collection tank. When a certain amount of 2,2,6, 6-tetramethylpiperidol is collected in the recovery tank, the material circulation system is opened intermittently, and the sublimed raw materials are brought back to the reaction system by using the materials in the reaction system to continue to participate in the reaction. Gas chromatography was followed and monitored to the end of the reaction. Continue to pass nitrogen gas flow, control system temperature 130~135°C, control system vacuum degree above -0.098MPa, and pass nitrogen gas flow through the gas distributor, collect excess tetramethyl piperidol in the collection tank for the next batch. After that, the reaction liquid is transferred to the water washing and drying kettle, and the product is obtained after water washing and drying. The yield of bis (2,2,6, 6-tetramethylpiperidol) sebacate was 97.5% and the content was 98.8%.

[0032] Embodiment 2 Change the feeding formula in Embodiment 1 to 2,2,6, 6-tetramethylpiperidol 330.1Kg (2.1 kmol), 230Kg (1kmol) of dimethyl dimethylate and 5.68Kg (0.02mol) of catalyst tetramethyltitanate were heated to react at 120-125 °C, and 2,2,6, 6-tetramethylpiperidol in the collection tank was dissolved into the reaction kettle using the methanol generated by the reaction. Follow-up operation

Refer to Embodiment 1. The yield of bis (2,2,6, 6-tetramethylpiperidol) sebacate was 97.6% and the content was 98.6%. [0033] Embodiments 3-5

[0034] The yield and quality of bis (2,2,6, 6-tetramethylpiperidol) dicarbamate and bis (1, 2,2,6, 6-pentamethylpiperidol) dicarbamate were prepared in order to adjust the formula, reaction temperature, vacuum degree and other operating conditions. The specific formulations and operating parameters are shown in Table 1.

[0035] Table 1 Preparation of bis (2,2,6, 6-tetramethylpiperidol) sebacate and bis (1, 2,2,6, 6-pentamethylpiperidol) sebacate

	实施例 3	实施例 4	实施例 5
	配方：四甲基哌啶醇 330.1Kg (2.1kmol), 壁二酸二乙酯 258.3Kg (1kmol)、催化剂钛酸四 乙酯 5.7Kg (0.025kmol)	配方：五甲基哌啶醇 411.1Kg (2.4kmol), 壁二酸二甲酯 258.3Kg (1kmol)、催化剂钛酸四 甲酯 2.84Kg (0.01kmol)	配方：五甲基哌啶醇 411.1Kg (2.4kmol), 壁二酸二异丙酯 286Kg (1kmol)、催化剂钛酸四异 丙酯 1.43Kg (0.005kmol)
	保温反应温度 130~150°C	保温反应温度 80~115°C	保温反应温度 120~125°C
	保温反应体系压力 0.05~0.1Mpa	保温反应体系压力 0.05~0.1Mpa	保温反应体系压力 0.04~0.06Mpa
	收率 95.3%	收率 97.8%	收率 98.8%
	含量 97.8%	含量 98.3%	含量 98.3%

[0037] The method and device of the invention can also be used for the preparation of 2,2,6, 6-tetramethylpiperidinyl fatty acid ester and 1, 2,2,6,6, -pentamethylpiperidinyl fatty acid ester. The process formulation operating parameters, yield and quality results of specific examples 6~8 are shown in Table 2:

[0038] Table 2 Preparation of tetramethylpiperidyl fatty acid ester and pentamethylpiperidyl fatty acid ester

	实施例 6	实施例 7	实施例 8
	配方：四甲基哌啶醇 165Kg (1.05kmol), 脂肪酸甲酯 281.6Kg (1kmol)、催化剂钛酸四异丙酯 1.5Kg (0.005mol)	配方：五甲基哌啶醇 205Kg (1.2kmol), 脂肪酸甲酯 281.6Kg (1kmol)、催化剂钛酸四异戊酯 8Kg (0.01mol)	配方：五甲基哌啶醇 205Kg (1.2kmol), 脂肪酸乙酯 295.6Kg (1kmol)、催化剂钛酸四乙酯 14.8Kg (0.065)
	保温反应温度 115~125°C	保温反应温度 140~145°C	保温反应温度 100~115°C
	保温反应体系压力 -0.05~-0.098Mpa	保温反应体系压力 0.04~0.05Mpa	保温反应体系压力 0.04~0.05Mpa
	收率 98.5%	收率 98.9%	收率 95.8%
	含量 98.8%	含量 99.3%	含量 96.9%

[0040] The method and device of the invention can also be used for the preparation of 2,2,6,6, tetramethylpiperidinyl benzoate and 1,2, 6, 6-pentamethylpiperidinyl benzoate. The operation parameters, yield and quality results of the process formulation in embodiments 9~10 are shown in Table 3:

[0041] Table 3 Preparation of tetramethylpiperidol benzoate and pentamethylpiperidol benzoate

	实施例 9	实施例 10
[0042]	配方：四甲基哌啶醇 204Kg (1.3kmol)，苯甲酸甲酯 136Kg (1kmol)、催化剂钛酸四异丙酯 13.6Kg (0.05mol)	配方：五甲基哌啶醇 222Kg (1.5kmol)，苯甲酸乙酯 150Kg (1kmol)、催化剂钛酸钛酸二乙二酯 2.4Kg (0.02mol)
	保温反应温度 115~125℃	保温反应温度 140~150℃
	保温反应体系压力-0.09~0.098Mpa	保温反应体系压力-0.05~-0.06Mpa
	收率 97.8%	收率 98.8%
	含量 98.8%	含量 99.3%

[0043] Embodiment 11 Equipment constructed according to a method for the preparation of a hindered amine light stabilizer described in Embodiment 1, including:

[0044] Reaction vessel 1, having a reaction chamber, is provided with a material circulation port and a mounting hole at the top and a liquid outlet at the bottom, and the liquid outlet pipe arranged at the liquid outlet is divided into two ways, the first way 11 is a post-processing pipe for discharging the final reaction liquid after the reaction is completed; The second road 12 is used as a material circulation pipeline to communicate with the feed port pipeline of the recycling system, which is used to reintroduce the materials collected by the recycling system into the reaction vessel to participate in the reaction;

[0045] Stirring device 2, arranged on the top of the reaction vessel, and the stirring part of the stirring device extends into the reaction vessel from the mounting hole, used to stir the materials loaded into the reaction chamber;

[0046] inert gas supply unit 3, the intake end is connected with the external inert gas gas source pipeline, the outlet end is introduced into the bottom of the reaction vessel, used to introduce inert gas into the reaction vessel;

[0047] and the recycling and recovery system 4, the feed port is connected with the pipeline extending into the bottom of the reaction vessel, and the discharge port is connected with the material distributor 44 on the collection tank 42, which is used to recycle the recovered material into the reaction chamber of the reactor.

[0048] The circulating recovery system 4 comprises a circulating pump 41, a collection tank 42, a material communication pipe 43, a material distributor 44 and a material flow control valve 45. The liquid inlet end of the circulating pump 41 is communicated with a material communication pipe 43 extending into the bottom of the reaction vessel. The liquid outlet end of the circulating pump 41 is introduced into the top of the collection tank 42 through a pipeline and is arranged with the material at the top of the collection tank 42. The distributor 44 is connected for injecting materials into the collection tank 42; The outlet of the collection tank 42 is communicated with the pipe of the material circulation outlet at the top of the reaction container 1, which is used to re-inject the material in the collection tank into the reaction container.

[0049] The outer layer of the collection tank 42 is a jacket type structure, wherein the jacket is provided with jacket cooling heating medium inlet 421 and jacket cooling heating medium outlet 422, jacket cooling heating medium inlet 421, jacket cooling heating medium outlet 422 are communicated with the jacket cavity, used to pour media into the jacket to cool or heat the jacket; Collection tank 42 is provided with a number of columns with fins 423, fin column 423 cooling heating medium inlet 424, column tube cooling heating medium outlet 425 are extended to the outside of the collection tank 42, used to pour the medium into the fin to cool or heat the fin; The upper and lower parts of the collection tank 42 are respectively provided with an observation port 426.

[0050] the recycling material inlet of the collection tank 42 is located at the upper part of the collection tank, and the recycling material inlet is provided with a material distributor 44, wherein the feed port of the material distributor 44 is communicated with the discharge port of the material connecting pipe 43.

[0051]

The material connecting pipe 43 is provided with a control valve 45 for controlling the flow rate of the material.

[0052] The stirring device 2 comprises a stirring motor 21 and a stirring paddle 22. The stirring motor 21 is arranged on the top of the reaction vessel 1, the stirring paddle 22 is arranged on the mounting hole of the reaction vessel 1, and the output shaft of the stirring motor 21 is connected with the upper end of the stirring paddle 22, and the lower end of the stirring paddle 22 is extended from the mounting hole into the reaction chamber of the reaction vessel 1 for stirring things into the reaction chamber Material.

[0053] The inert gas supply unit 3 comprises an inert gas intake pipe 31, a gas flowmeter 32, a gas control valve 33 and a gas distributor 34. The intake end of the inert gas intake pipe 31 is communicated with an external inert gas gas source. The outlet end of the inert gas intake pipe 31 extends from the top of the reaction vessel 1 along the inner wall into the bottom of the reaction chamber and is arranged with the gas at the bottom of the reaction chamber

The distributor 34 is connected for distributing the inert gas into the reaction chamber; The gas flowmeter 32 and the gas volume control valve 33 are arranged on the inert gas intake pipe 31 for controlling the inert gas flow rate. The top of the by-product collection tank is provided with an air hole that can be communicated with the inner cavity, and the air hole is communicated with the external vacuum system pipeline through a vacuum tube, which is used to adjust the pressure in the by-product collection tank.

[0054] The pipe connecting the liquid inlet and outlet of the by-product collection tank is equipped with a control valve.

[0055] The device constructed by the preparation method of hindered amine light stabilizer also includes a variety of deformation, such as extending the material connecting pipe 43 from the reaction vessel 1 on the top outside the reaction vessel into the bottom of the reaction chamber; A nitrogen inlet pipe 31 May be connected with a gas distributor 34 from the outside of the reaction vessel through the bottom into the bottom position of the reaction vessel.

[0056] The contents of the embodiments of this specification and the appended drawings are merely an enumeration of the forms of realization of the idea of the invention, and the scope of protection of the invention shall not be regarded as limited to the specific forms stated in the embodiment. The scope of protection of the invention also includes equivalent technical means that can be thought of by persons skilled in the art according to the idea of the invention.

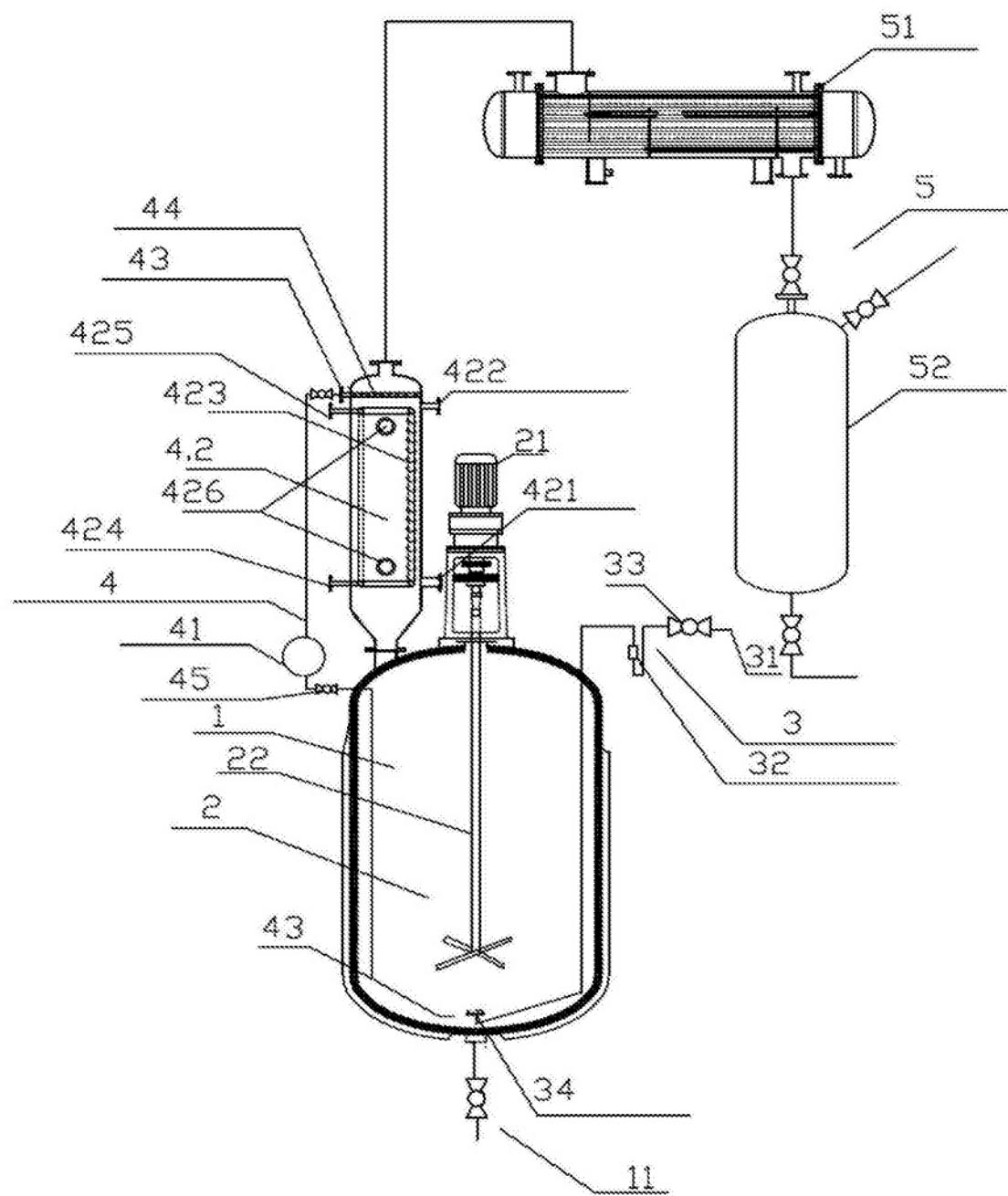


FIG. 1



(12) Utility model patent

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(ESM) The same invention has been applied for the invention patent on the same day

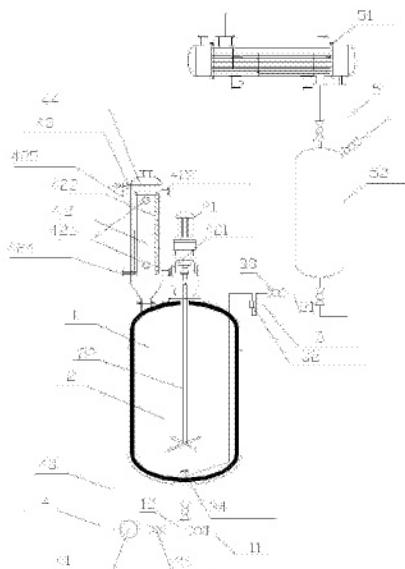
权利要求书2页 说明书6页 附图1页

(54) Name of utility model

The utility model relates to preparation equipment of hindered adhesive light stabilizer

(57) Abstract

The utility model relates to a preparation equipment for blocked adhesive light stabilizer, comprising a reaction vessel, which has a reaction chamber, a material circulation port and a mounting hole are arranged at the top, and a liquid outlet is arranged at the bottom. The liquid outlet pipe is divided into two ways, the first way is a post-processing pipe after the reaction is completed; The second road is used as a material circulation pipeline and the feed inlet pipe of the recycling system is connected: the stirring device is arranged on the top of the reaction vessel, and the stirring part of the stirring device extends into the reaction vessel from the installation hole; The inert gas supply unit, the intake end is connected with the external inert gas source pipeline, and the outlet end is introduced into the bottom of the reaction vessel; And the recycling and recovery system, the feed port is connected with the second pipeline of the reaction vessel, and the discharge port is connected with the second pipeline of the reaction vessel. The utility model has the advantages that the reaction process does not require solvent, is green and environmentally friendly, the reaction is thorough, the raw material utilization rate is high, the alcohol content obtained is high and can be used as by-products, the production process is simple and the operation is convenient.



1. A device for preparing hindered amine light stabilizer, which is characterized in that:

Reaction container, with a reaction chamber, the top is provided with a material circulation port and installation hole, the bottom is provided with a liquid outlet, and the liquid outlet pipe configured at the liquid outlet 1 is divided into two ways, the first way is the reaction after the transfer of the processing pipe, used to discharge the final reaction liquid; The first: the road is used as a material circulation pipeline and the feed port pipeline of the recycling system is connected, which is used to reintroduce the materials collected by the recycling system into the reaction container to participate in the reaction

The stirring device is arranged on the top of the reaction container, and the stirring part of the stirring device extends into the reaction container from the mounting hole for stirring the materials loaded into the reaction chamber

Inert gas supply unit, the intake end is connected with the external inert gas gas source pipeline, the outlet end is introduced into the bottom of the reaction vessel, used to introduce inert gas into the reaction vessel;

And recycling and recovery system, the feed port is connected with the second pipeline of the reaction vessel, and the discharge port is connected with the second pipeline of the reaction vessel, which is used to recycle the recovered material into the reaction chamber of the reactor.

2. As described in claim 1, a hindered amine light stabilizer preparation equipment, which is characterized by: the recycling system includes a circulating pump, collection tank, material connecting pipe, material distributor and material flow control valve, the liquid end of the circulating pump through the material connecting pipe and the second pipeline of the reaction vessel is connected, the liquid end of the circulating pump through the pipeline into the collection tank top Part, and is connected with the material distributor arranged at the top of the collection tank, used to inject materials into the collection tank; The outlet of the collection tank is connected with the pipeline of the material circulation outlet at the top of the reaction container, which is used to re-inject the material in the collection tank into the reaction container.

3. As described in claim 2, a hindered amine light stabilizer preparation equipment is characterized in that the outer layer of the collection tank is a jacketed structure, wherein the jacket is provided with a jacket cooling heating medium inlet and jacket cooling heating medium outlet, jacket cooling heating medium inlet and jacket cooling heating medium outlet are communicated with the jacket cavity for injecting the medium into the jacket to the jacket jacket The cooling or heating; The collection tank is provided with a number of column tubes with fins, the column tube cooling heating medium inlet of the fin, the column tube cooling heating medium outlet are extended to the outside of the collection tank, used to pour the medium into the fin to cool or heat the fin; The upper and lower parts of the collection tank are respectively provided with an observation port.

4. As described in claim 3, the preparation equipment of hindered amine light stabilizer is characterized in that the circulating material inlet of the collection tank is located at the upper part of the collection tank, and the circulating material inlet is provided with a material distributor, wherein the feed port of the material distributor is communicated with the outlet pipe of the material connecting pipe.

The preparation equipment of a blocked amine light stabilizer as described in claim 4 is characterized in that the material connecting pipe is provided with a control valve for controlling the flow rate of the material.

6. As described in claim 1, a hindered amine light stabilizer preparation equipment is characterized in that the inert gas supply unit includes an inert gas intake pipe, a gas flow meter, a gas control valve and a gas distributor, the intake end of the inert gas intake pipe is connected with the external inert gas gas source, and the output end of the inert gas intake pipe extends from the top of the reaction vessel along the inner wall Should be at the bottom of the chamber, and connected with the gas distributor arranged at the bottom of the reaction chamber, used to distribute the inert gas into the reaction chamber; The gas flowmeter and gas volume control valve are arranged on the inert gas intake pipe for controlling the flow rate of inert gas.

7. As described in claim 1, a hindered amine light stabilizer preparation equipment, which is characterized by: the stirring device comprises a stirring motor and a stirring paddle, the stirring motor is arranged on the top of the reaction vessel, the stirring paddle holder is installed in the mounting hole of the reaction vessel, and the output shaft of the stirring motor is connected with the upper end of the stirring paddle, the lower end of the stirring paddle extends from the mounting hole into the reaction chamber of the reaction vessel Inside.

8. The preparation equipment of a blocked adhesive light stabilizer as described in claim 1 is characterized in that it also comprises a by-product collection system, the by-product collection system comprises a condenser and a by-product collection tank, and the air inlet of the condenser and a collection tank

The top air outlet pipe is connected, and the liquid outlet of the condenser is connected with the liquid inlet pipe of the byproduct collection tank, which is used to condense the byproduct escaping from the top of the collection tank into the byproduct collection tank.

9. As described in claim 8, a hindered amine light stabilizer preparation equipment is characterized in that the top of the by-product collection tank is provided with an air hole that can be communicated with the inner cavity, and the air hole is communicated with the external vacuum system pipeline through a vacuum tube for regulating the pressure in the by-product collection tank.

- Kind of EBEE preparation

Technical fields

[0001] The utility model relates to a preparation equipment for hindered amine light stabilizer, belonging to the production and manufacturing field of chemical supplies.

Background technology

[0002] In the prior art, one of the common methods for the synthesis of low molecular weight hindered amine light stabilizers is: 2, 2, 6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol and their nitrogen oxides are transesterification with organic acid esters in organic solvents under the action of catalysts, and the resulting alcohols are taken out by distillation solvent to promote the equilibrium movement , so that the reaction is complete. The organic acids include fatty acids, mallow acid, benzoic acid, butane tetracarboxylic acid, etc. The ester is methyl ester, ethyl ester; The catalyst is titanate catalyst, sodium methanol, dibutyl tin oxide and so on. The titanate catalyst has tetraisopropyl titanate, tetrabutyl titanate, isoamyl titanate, diethyl titanate and supported titanate catalyst, etc. The organic solvent is n-octane, xylene, petroleum ether and other solvents.

[0003] China patent (CN103274994A) the polymerization inhibitor 701 (that is, 2, 2, 6, 6-tetramethylpiperidol nitrogen oxide free radical) and methyl stearate under the catalysis of titanate, in the n-octane reaction, and by steaming out the n-octane methanol, after treatment products. The Chinese patent (CN101665457A) uses 2,2,6, 6-tetramethylpiperidol and dimethyl sebacate as raw materials, and dibutyltin oxide as catalyst for the reaction in xylene. The Chinese patent (CN101768104B) uses 1,2,2,6, 6-5. Methylpiperidol and dimethyl sebacate were used as raw materials, and titanate supported by activated carbon was used as catalyst to react in petroleum ether. The Chinese patent (CN101774963B) uses 2,2,6, 6-tetramethylpiperidol and fatty acid methyl ester as raw materials, titanate and other catalysts to react in alkanes and cycloalkanes solvents such as n-octane to prepare the corresponding light stabilizer. The Chinese patent (CN101774963B) also uses the n-octane alkane and cycloalkane as the solvent to promote the reaction by reflux methanol separation.

[0004] The defects of the prior art are :1, the organic solvents used are flammable and volatile solvents, which will inevitably increase the safety hazards and the emission of unorganized gases in the use process, increase the environmental protection risks and treatment costs, and the solvent loss will also cause the production cost to increase. 2, because the methanol generated during the reaction process has a certain solubility in the organic solvent, the methanol must be removed as far as possible before the solvent is applied to ensure a better use effect, which also increases the post-treatment operation and cost. The methanol obtained from the reaction can not be effectively used. 3. Due to the sublimation of 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol, it is easy to sublime in the process of reaction, solvent distillation and recovery, which leads to blockage of the distillation pipeline, affecting the evaporation of methanol from the reaction system, and further affecting the equilibrium movement of transesterification reaction. 4. Pipeline blockage also leads to the reduction of solvent distillation rate, and a large amount of solvent remains in the system. 5. Sublimation of 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol also resulted in the reduction of raw material utilization efficiency and the increase of raw material consumption when feeding.

Contents of invention

[0005] Problems such as solvent loss, environmental pollution, safety hazards, post-treatment of solvent before application due to the use of organic solvent for prior art; At the same time, due to the raw material 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol due to its easy sublimation properties, pipeline blockage will affect the distillation of alcohol and solvent distillation, resulting in a low reaction degree, high solvent residue rate in the system, 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol and other raw materials. The material can not be fully utilized, and the utility model provides a preparation equipment for blocked adhesive light stabilizer. The utility model has the advantages that the reaction process does not require solvent, green environmental protection, the reaction is thorough, the raw material utilization rate is high, the alcohol content obtained is high and can be used as by-products, and the production process is simple.

The utility model has the advantages of single and convenient operation.

[0006] The utility model relates to a preparation equipment for hindered amine light stabilizer, which is characterized in that:

[0007] reaction vessel has a reaction chamber, the top is provided with a material circulation port and a mounting hole, the bottom is provided with a liquid outlet, and the liquid outlet is configured at the liquid outlet is divided into two ways, the first way is the reaction after the transfer of the processing pipeline, used to discharge the final reaction liquid; The second road as a material circulation pipeline and circulation recovery system feed port pipeline communication, used to recycle the recycling system collected materials reintroduced into the reaction container to participate in the reaction;

[0008] The stirring device is arranged on the top of the reaction vessel, and the stirring part of the stirring device extends into the reaction vessel from the mounting hole, which is used to stir the materials into the reaction chamber;

[0009] inert gas supply unit, the intake end is connected with the external inert gas source pipeline, the outlet end is introduced into the bottom of the reaction vessel, used to introduce inert gas into the reaction vessel;

[0010] and the recycling and recovery system, the feed port is connected with the second pipeline of the reaction vessel, and the discharge port is connected with the second pipeline of the reaction vessel, which is used to recycle the recovered material into the reaction chamber of the reactor.

[0011] The recycling system includes a circulating pump, collection tank, material connecting pipe, material distributor and material flow control valve, the liquid end of the circulating pump through the material connecting pipe and the reaction vessel of the second pipeline communication, the liquid end of the circulating pump through the pipeline into the top of the collection tank, and is connected with the material distributor arranged on the top of the collection tank, used to inject materials into the collection tank; The outlet of the collection tank is connected with the pipeline of the material circulation port at the top of the reaction container, which is used to re-inject the material in the collection tank into the reaction container.

[0012] The outer layer of the collection tank is a jacket type structure, wherein the jacket is provided with a jacket cooling heating medium inlet and jacket cooling heating medium outlet, jacket cooling heating medium inlet and jacket cooling heating medium outlet are communicated with the jacket cavity, used to pour cooling or heating medium into the jacket to cool or heat the jacket; Collection tank is provided with a number of columns with fins, fin column cooling heating medium inlet, pipe cooling heating medium outlet are extended to the outside of the collection tank, used to pour cooling or heating medium into the fin to cool or heat the fin; The upper and lower parts of the collection tank are respectively provided with an observation port.

[0013] The recycling material inlet of the collection tank is located at the upper part of the collection tank, and the recycling material inlet is provided with a material distributor, wherein the feed port of the material distributor is communicated with the outlet pipe of the material connecting pipe.

[0014] The material connecting pipe is provided with a control valve for controlling the flow rate of the material.

[0015] the stirring device comprises a stirring motor and a stirring paddle, the stirring motor is arranged on the top of the reaction vessel, the stirring paddle holder is installed in the mounting hole of the reaction vessel, and the output shaft of the stirring motor is connected with the upper end of the stirring paddle, the lower end of the stirring paddle extends from the mounting hole into the reaction chamber of the reaction vessel for stirring the material into the reaction chamber.

[0016] The inert gas supply unit comprises an inert gas intake pipe, a gas flow meter, a gas control valve and a gas distributor. The intake end of the inert gas intake pipe is communicated with the external inert gas source. The outlet end of the inert gas intake pipe extends from the top of the reaction vessel along the inner wall into the bottom of the reaction chamber, and is connected with the gas distributor arranged at the bottom of the reaction chamber to distribute the inert gas into the reaction chamber; The gas flowmeter and gas volume control valve are arranged on the inert gas intake pipe for controlling the flow rate of inert gas.

[0017] Also comprises a by-product collection system, the by-product collection system comprises a condenser and a by-product collection tank, the air inlet of the condenser is connected with the air outlet pipe at the top of the collection tank, and the liquid outlet of the condenser is connected with the liquid inlet pipe of the by-product collection tank, which is used to condense the by-product escaping from the top of the collection tank into the by-product collection tank.

[0018] The top of the by-product collection tank is provided with a vent hole that can be communicated with the inner cavity, and the vent hole is communicated with the external vacuum system pipeline through a vacuum tube, which is used to adjust the pressure in the by-product collection tank.

[0019] The pipe connecting the liquid inlet and outlet of the by-product collection tank is equipped with a control valve.

[0020] The utility model relates to a preparation method of blocked amine light stabilizer, which is characterized in that the method comprises the following steps:

[0021] The utility model relates to a preparation method of a hindered amine light stabilizer, which comprises the following steps:

[0022] 1) The piperidol, the organic acid ester and the catalyst are mixed and the heat preservation reaction is carried out under the condition of 80~150°C, and the alcohol partially generated is steamed out; The piperidol is 2,2,6, 6-tetramethylpiperidol or 1,2,2,6, 6-pentamethylpiperidol; The organic acid ester is an ester formed by C8~C20 fatty acid, sebacic acid or benzoic acid and low molecular weight alcohol; The low molecular weight alcohol is methanol, ethyl ester or isopropyl ester. The catalyst is titanate;

[0023] 2) The temperature in the reaction vessel is controlled to be 80~150°C and the pressure to be -0.05~-0.10MPa to further steam out the generated alcohol.

[0024] 3) The inert gas is passed into the reaction vessel, and the temperature in the reaction vessel is controlled to be 80~150°C and the pressure to be -0.10~-0.10MPa, and the reaction is kept warm until the reaction is complete. After the reaction, the material is washed and dried to obtain the hindered amine light stabilizer. During the reaction process, the sublimated piperidol is recovered and re-introduced into the reaction vessel to participate in the reaction.

[0025] In the process of reaction, no additional solvent was added to entrainment low molecular weight alcohols, but in step 3) inert gas was used to entrainment low molecular weight alcohols to promote the equilibrium movement of the reaction and promote the complete reaction.

[0026] During the reaction, sublimed piperidol is collected and reintroduced into the reaction vessel to participate in the reaction.

[0027] The ratio of the amount of piperidol to the organic acid ester based substance is 1~1.2:1.

[002] The catalyst is tetramethyl titanate, tetraethyl titanate, tetraisopropyl titanate, tetrabutyl titanate, isoamyl titanate, diethyl titanate, and the mass dosage of the catalyst is 0.05%~10% of the weight of the organic acid ester.

[0029] The temperature of step 1) ~3) is preferably 100~140°C.

[0030] The utility model has the advantages that the reaction process does not require solvent, green environmental protection, the reaction is thorough, the raw material utilization rate is high, the obtained alcohol content is high and can be used as by-products, the production process is simple and the operation is convenient.

Illustrations are attached.

[0031] Figure 1 is a structure diagram of the utility model.

Specific implementation mode

[0032] The utility model is further explained in combination with the attached drawings.

[0033] With reference to the attached drawings:

[0034] Embodiment 1 The utility model relates to a preparation equipment for hindered amine light stabilizer, which comprises:

[0035] Reaction vessel 1 has a reaction chamber, the top is provided with a material circulation port and a mounting hole, the bottom is provided with a liquid outlet, and the liquid outlet is configured at the liquid outlet is divided into two ways, the first way 11 is the reaction after the transfer of the processing pipe, used to discharge the final reaction liquid; The second road 12 is used as a material circulation pipeline to communicate with the feed port pipeline of the recycling system, which is used to reintroduce the materials collected by the recycling system into the reaction vessel to participate in the reaction;

[0036] Stirring device 2, arranged on the top of the reaction vessel, and the stirring part of the stirring device extends into the reaction vessel from the mounting hole, used to stir the materials loaded into the reaction chamber;

[0037] inert gas supply unit 3, the intake end is connected with the external inert gas gas source pipeline, the outlet end is introduced into the bottom of the reaction vessel, used to introduce inert gas into the reaction vessel;

[0038] and the recycling and recovery system 4, the feed port is connected with the second pipeline of the reaction vessel, and the discharge port is connected with the reaction capacity

The second pipe of the device is connected for recirculating the recovered material into the reaction chamber of the reactor.

[0039] The circulating recovery system 4 comprises a circulating pump 41, a collection tank 42, a material connecting pipe 43, a material distributor 44 and a material flow control valve 45. The liquid inlet end of the circulating pump 41 is communicated with the second pipeline of the reaction vessel through the material connecting pipe 43, and the liquid outlet end of the circulating pump 41 is introduced into the top of the collection tank 42 through the pipeline, and is arranged on the top of the collection tank 42. The material distributor 44 is connected to the collection tank 42 for the injection of materials; The outlet of the collection tank 42 is communicated with the pipe of the material circulation outlet at the top of the reaction container 1, which is used to re-inject the material in the collection tank into the reaction container.

[0040] The outer layer of the collection tank 42 is a jacketed structure, wherein a jacketed cooling and heating medium inlet 421 and a jacketed cooling and heating medium outlet 422 are provided on the jacket, and the jacketed cooling and heating medium inlet 421 and the jacketed cooling and heating medium outlet 422 are communicated with the inner cavity of the jacket, and are used to pour media into the jacket to cool or heat the jacket; Collection tank 42 is provided with a number of columns with fins 423, fin column 423 cooling heating medium inlet 424, column tube cooling heating medium outlet 425 are extended to the outside of the collection tank 42, used to pour the medium into the fin to cool or heat the fin; The upper and lower parts of the collection tank 42 are respectively provided with an observation port 426.

[0041] The circulating material inlet of the collecting tank 42 is located at the upper part of the collecting tank, and the circulating material inlet is provided with a material distributor 44, wherein the feeding port of the material distributor 44 is communicated with the discharge port of the material connecting pipe 43.

[0042] The material connecting pipe 43 is provided with a control valve for controlling the flow rate of the material.

[0043] The tank diameter ratio between the collection tank 42 and the material connecting pipe 43 is 1~50:1.

[0044] The stirring device 2 comprises a stirring motor 21 and a stirring paddle 22, the stirring motor 21 is arranged on the top of the reaction vessel 1, the stirring paddle 22 is arranged on the mounting hole of the reaction vessel 1, and the output shaft of the stirring motor 21 is connected with the upper end of the stirring paddle 22, and the lower end of the stirring paddle 22 extends from the mounting hole into the reaction chamber of the reaction vessel 1 for stirring things into the reaction chamber Material. [0045] the inert gas supply unit 3 comprises an inert gas intake pipe 31, a gas flowmeter 32, a gas control valve 33 and a gas distributor 34. The intake end of the inert gas intake pipe 31 is connected with an external inert gas gas source, and the inert gas intake

The outlet end of the tube 31 extends from the top of the reaction vessel 1 along the inner wall into the bottom of the reaction chamber, and is connected with the gas distributor 34 arranged at the bottom of the reaction chamber for distributing the inert gas into the reaction chamber; The gas flowmeter 32 and the gas volume control valve 33 are arranged. On the inert gas intake pipe 31, it is used to control the inert gas flow rate.

[0046] Embodiment 2 This embodiment differs from Embodiment 1 in that the by-product collection system 5 also includes a condenser 51 and a by-product collection tank 52, and the air inlet of the condenser is communicated with the air outlet line at the top of the collection tank, and the liquid outlet of the condenser is communicated with the liquid inlet line at the byproduct collection tank for the by-product escaping from the top of the collection tank The by-product collection tank is condensed into the by-product collection tank.

[0047] The top of the by-product collection tank is provided with a vent hole that can be communicated with the inner cavity, and the vent hole is communicated with the external vacuum system pipeline through a vacuum tube, and is used to adjust the pressure in the by-product collection tank.

[0048] The pipe connecting the liquid inlet and outlet of the by-product collection tank is equipped with a control valve.

[0049] Embodiment 3 Put 2,2,6, 6-tetramethylpiperidol 345.8Kg (2.2kmol), dimethyl sebacate 230.3Kg (1kmol), catalyst tetraisopropyl titanate 2.84Kg (0.01mol) into the reaction vessel Temperature was raised to 120~125°C for heat preservation reaction, the control system pressure was -0.05~-0.100MPa, the alcohol generated by distillation reaction to basically no evaporation. Open the vacuum to make the system vacuum to -0.098MPa, and then through the gas distributor into the nitrogen gas flow rate of 20L/s, and control the system temperature 120~125°C to continue the heat preservation reaction. 2,2,6, 6-tetramethylpiperidol sublimed during the reaction was collected in a collection tank. When a certain amount of 2,2,6, 6-tetramethylpiperidol is collected in the recovery tank, the material circulation system is opened intermittantly, and the sublimed raw materials are brought back to the reaction system by using the materials in the reaction system to continue to participate in the reaction. Gas chromatography was followed and monitored to the end of the reaction. The air flow of nitrogen was continued, the temperature of the system was controlled at 130~135°C, and the vacuum of the system was controlled at -0.098MPa

Above, and through the gas distributor into the gas flow, the flow rate of 50L/s, the excessive tetramethylpiperidol is collected in the collection tank for the next batch. After the reaction liquid is transferred to the washing and drying kettle, the product is obtained after washing and drying. The yield of bis (2,2,6,6-tetramethylpiperidol) sebacate was 97.5% and the content was 98.8%.

[0050] Embodiment 4 Change the feeding formula in Embodiment 3 to 2,2,6,6-tetramethylpiperidol 330.1Kg (2.1 kmol), dimethyl sebacate 230Kg (1kmol), catalyst tetramethyltitanate 5.68Kg (0.02mol), the temperature rises to 120~125°C for the reaction, and the methanol generated by the reaction is used to dissolve 2,2,6,6-tetramethylpiperidol in the collection tank into the reaction kettle. The subsequent operations are carried out in reference to Embodiment 1. The yield of bis (2,2,6,6-tetramethylpiperidol) sebacate was 97.6% and the content was 98.6%.

[0051] Embodiments 5 to 7

[0052] The yield and quality of bis (2,2,6,6-tetramethylpiperidol) sebacate and bis (1,2,2,6,6-pentamethylpiperidol) sebacate were prepared in order to adjust the formula and reaction temperature, airflow velocity, vacuum degree and other operating conditions. The specific formula and operating parameters are shown in Table 1.

[0053] Table 1 Preparation of bis (2,2,6,6-tetramethylpiperidol) sebacate and bis (1,2,2,6,6-pentamethylpiperidol) sebacate

	实施例 5	实施例 6	实施例 7
	配方：四甲基哌啶醇 330.1Kg (2.1kmol), 柔二酸二乙酯 258.3Kg (1kmol)、催化剂钛酸四 乙酯 5.7Kg (0.025kmol)	配方：五甲基哌啶醇 411.1Kg (2.4kmol), 柔二酸二甲酯 258.3Kg (1kmol)、催化剂钛酸四 甲酯 2.84Kg (0.01kmol)	配方：五甲基哌啶醇 411.1Kg (2.4kmol), 柔二酸二异丙酯 286Kg (1kmol)、催化剂钛酸四异 丙酯 1.43Kg (0.005kmol)
[0054]	保温反应温度 130~150°C	保温反应温度 80~115°C	保温反应温度 120~125°C
	保温反应体系压力 0.05~0.1Mpa	保温反应体系压力-0.05~-0.1Mpa	保温反应体系压力-0.04~-0.06Mpa
	氮气流速：150~200L/S	氮气流速：0.20~10L/S	氮气流速：20~50L/S
	收率 95.3%	收率 97.8%	收率 98.8%
	含量 97.8%	含量 98.3%	含量 98.3%

[0055] The utility model can also be used for the preparation of 2,2,6,6-tetramethylpiperidyl fatty acid ester and 1,2,2,6,6-pentamethylpiperidyl fatty acid ester. The operation parameters, yield and quality results of the process formulation of embodiments 8~10 are shown in Table 2:

[0056]

Table 2 Preparation of tetramethylpiperidinyl fatty acid ester and pentamethylpiperidinyl fatty acid ester

	实施例 8	实施例 9	实施例 10
	配方：四甲基哌啶醇 165Kg (1.05kmol), 脂肪酸甲酯 281.6Kg (1kmol)、催化剂钛酸四异丙酯 1.5Kg (0.005mol)	配方：五甲基哌啶醇 205Kg (1.2kmol), 脂肪酸甲酯 281.6Kg (1kmol)、催化剂钛酸四异戊酯 8Kg (0.01mol)	配方：五甲基哌啶醇 205Kg (1.2kmol), 脂肪酸乙酯 295.6Kg (1kmol)、催化剂钛酸四乙酯 14.8Kg (0.065)
[0057]	保温反应温度 115~125°C	保温反应温度 140~145°C	保温反应温度 100~115°C
	保温反应体系压力 -0.05~-0.098Mpa	保温反应体系压力-0.05~-0.08Mpa	保温反应体系压力 0.04~0.05Mpa
	氮气流速：10~30L/S	氮气流速：30~50L/S	氮气流速：100~150L/S
	收率 98.5%	收率 98.9%	收率 95.8%
	含量 98.8%	含量 99.3%	含量 96.9%

[0058] The utility model can also be used for the preparation of 2,2,6,6-tetramethylpiperidinyl benzoate and 1,2,2,6,6-pentamethylpiperidinyl benzoate. The operation parameters, yield and quality results of the process formulation of embodiments 11~12 are shown in Table 3:

[0059] Table 3 Preparation of tetramethylpiperidinyl benzoate and pentamethylpiperidinyl benzoate

	实施例 11	实施例 12
配方:	四甲基哌啶醇 204Kg (1.3kmol), 苯甲酸甲酯 136Kg (1kmol)、催化剂钛酸四异丙酯 13.6Kg (0.05mol)	五甲基哌啶醇 222Kg (1.5kmol), 苯甲酸乙酯 150Kg (1kmol)、催化剂钛酸钛酸二乙二酯 2.4Kg (0.02mol)
[0060]	保温反应温度 115~125℃	保温反应温度 140~150℃
	保温反应体系压力 0.09~0.098Mpa	保温反应体系压力 0.05~0.06Mpa
	氮气流速: 10~30L/S	氮气流速: 20~50L/S
	收率 97.8%	收率 98.8%
	含量 98.8%	含量 99.3%

[0061] The device constructed by the preparation method of the hindered adhesive light stabilizer also comprises a variety of deformation, such as extending the material connecting tube 43 from the top of the reaction vessel 1 along the inner wall into the bottom of the reaction chamber; A nitrogen inlet pipe 31 May be connected with a gas distributor 34 from the outside of the reaction vessel through the bottom of the reaction vessel into the bottom position inside the reaction vessel.

[0062] The contents of the embodiments of the specification and the attached drawings are only an enumeration of the realization form of the idea of the utility model. The scope of protection of the utility model shall not be regarded as limited to the specific form stated in the embodiment. The scope of protection of the utility model also includes equivalent technical means that can be thought of by the technical personnel in the field according to the idea of the utility model.

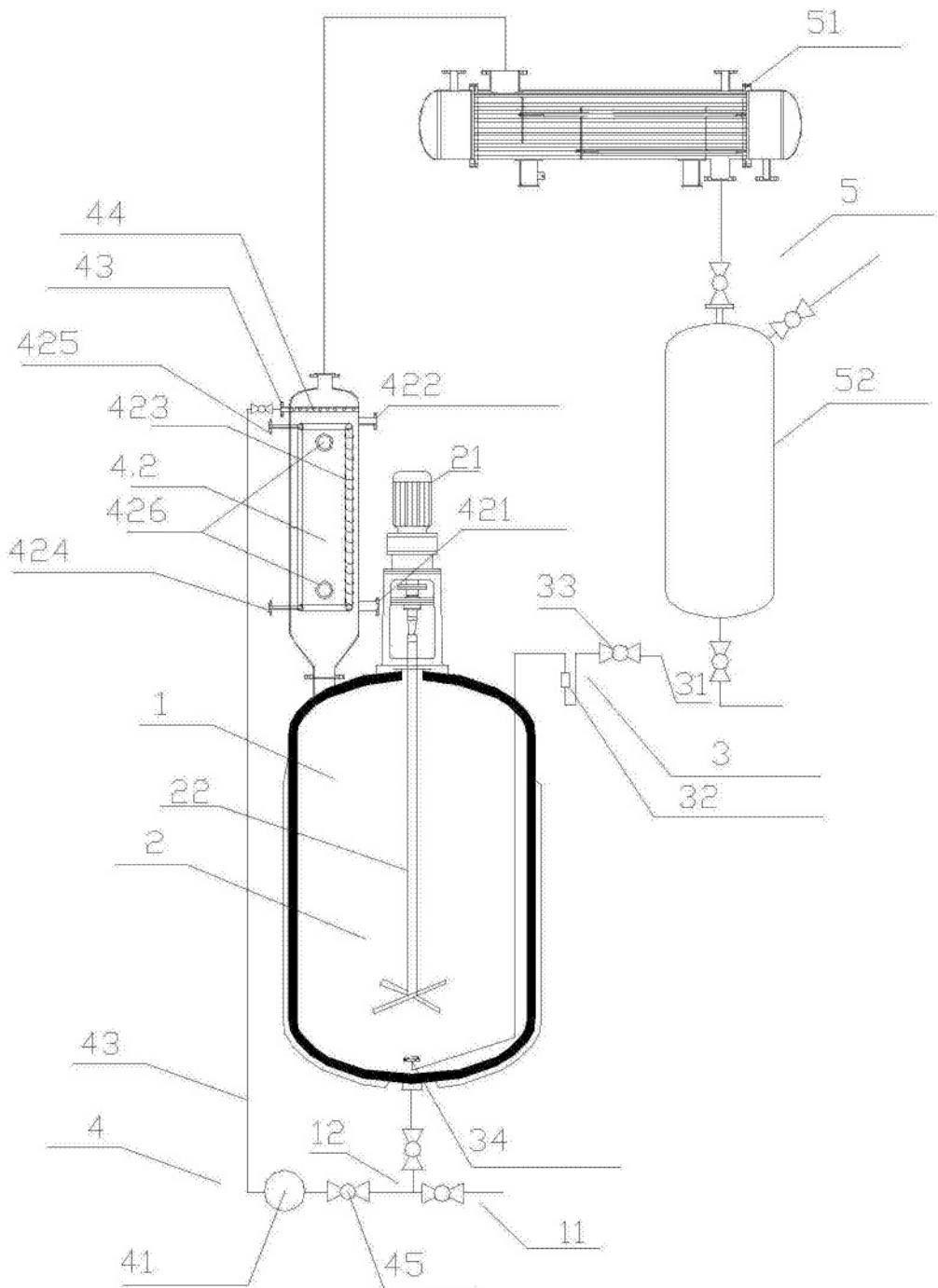


FIG. 1



(12) Utility model patent

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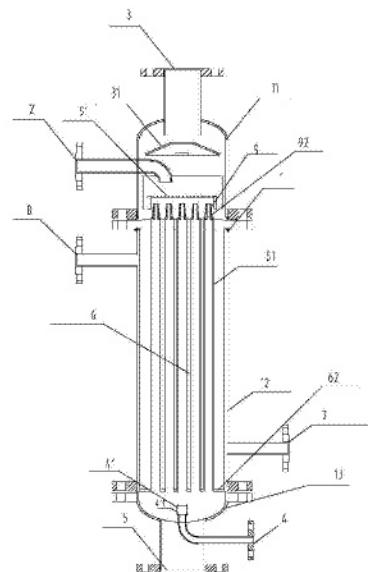
权利要求书1页 说明书4页 附图4页

(54) Utility model name

The utility model relates to water vapor distillation equipment

(57) Abstract

A water vapor distillation apparatus, including a distillation apparatus, having a distillation area for distilling materials in the middle of the distillation apparatus, and at least one material inlet pipe for introducing materials into the distillation area and at least one light component outlet for discharging light components in the materials are provided in the upper part of the distillation apparatus. The lower part of the still is provided with a steam inlet for steam into the distillation area and at least one recombination branch outlet for discharging the material in the recombination branch, the distillation area is equipped with a column pipe distributor for conveying the material from the material inlet to the distillation area, and the distillation area is provided with a hot medium inlet tube for heating the material in the conveying pipeline system and a medium outlet for discharging the heat exchange medium. The utility model has the advantages that: according to the nature of the material, the material can be preheated to improve the distillation effect. In addition, the water vapor distillation effect can be optimized by adjusting the feeding speed and changing the film thickness of the material. For materials with higher boiling point, vacuum distillation can be used to improve the distillation effect.



1. A water vapor distillation apparatus including a still having a distillation area for distilling a material in the middle of the still, characterized in that the upper part of the still is provided with at least one material inlet pipe for introducing a material into the distilling area and at least one light component outlet for discharging a light component in the material, and the lower part of the still is provided with a steam inlet and a steam inlet and a steam inlet for passing steam into the distilling area. The distillation area is equipped with a column pipe distributor for conveying the material from the material inlet to the distillation area, and the distillation area is provided with a hot medium inlet pipe for heating the material in the conveying pipeline system and a medium outlet for discharging the heat exchange medium.

2. As described in claim 1, a water vapor distillation equipment, which is characterized by: the distiller includes an upper head, a simplified head and a lower head, the upper head and the lower head are sealed in the upper and lower ends of the cylinder, wherein the upper head is provided with at least one material inlet pipe and at least one light component outlet, the lower head is provided with a steam inlet and at least one reorganization branch outlet; The cylinder body cavity as a distillation area of the distiller, the simplified is provided with a first heating jacket, the upper head is provided with a second heating jacket outside, and the first heating jacket and the second heating jacket is connected, the first heating jacket is provided with a hot medium into the tube, the lower part of the medium outlet, so that the first heating jacket, the second heating jacket can be passed into the heat exchange medium.

3. As claims 2 of a water vapor distillation equipment, which is characterized by: the output end of the material inlet tube is equipped with a material distributor, the material distributor includes a showerhead and connecting pipe, which leaves a gap between the outer wall of the showerhead and the inner wall of the distiller for light components through, the inlet end of the showerhead and the output end of the material inlet tube sealed and connected, the bottom discharge hole of the showerhead Facing the distillation area, and each discharge hole is equipped with a connecting pipe, the upper end of the connecting pipe is sealed and connected with the discharge hole corresponding to the showerhead, and the lower end of the connecting pipe is connected with the inlet end of the tube distributor.

4. As described in claim 3, a water vapor distillation equipment is characterized in that the connecting pipe is a conical tube with a small upper and large lower part.

5. As a water vapor distillation equipment described in claim 1 or 3, the characteristics are that the pipe distributor includes a tube for conveying materials and a lower sealing plate, the tube runs through the entire distillation area, and corresponds to the connecting pipe one by one, the upper end of the tube and the lower end of the connecting pipe are sealed and connected, and the lower end of the tube is extended and embedded to the bottom of the reactor under the sealing plate should be installed at the hole.

6. As a water vapor distillation equipment described in claim 5, its characteristics are: the column tube is a cylindrical tube with a smooth inner wall, and the upper and lower ends of the column tube are connected, and the column tubes are parallel to each other.

· A water vapor distillation equipment as described in claim 1 is characterized in that the light component outlet connected with the distiller is equipped with a defroster.

8. A water vapor distillation equipment as described in claim 1 is characterized in that the end of the steam inlet pipe connected with the still is equipped with a steam device

9. A water vapor distillation equipment as described in claim 8 is characterized in that the steam distributor is a hollow cylinder sealed at the upper end, and the lower part of the cylinder is sealed and communicated with the output end of the steam inlet pipe, and the side wall of the cylinder is provided with a number of steam through holes that can be communicated with the inner cavity of the cylinder.

The invention relates to a water vapor distillation equipment

Technical fields

[0001] The utility model relates to a water vapor distillation equipment.

Background technology

[0002] Water vapor distillation is an important method for separating and purifying compounds. It is widely used in the fields of fine chemicals, oil processing, pharmaceutical and traditional Chinese medicine, such as recovery of solvents, recovery of excess raw materials for reaction, purification of high-boiling substances and removal of trace high-boiling impurities.

[0003] At present, the conventional water vapor distillation is usually to pass the steam pipe into the still, so that the steam and the material contact, so that the components to be distilled out, to achieve the purpose of water vapor distillation. For example, CN201320336230.6 describes a kind of water vapor distillation, at the bottom of the distillation, increase the steam inlet pipe, and the steam outlet is equipped with a steam distributor, to increase the dispersion effect of steam in the material, to achieve the purpose of improving the effect of water vapor distillation.

[0004] Although the use of this equipment than no steam distributor, the direct steam pipeline into the material effect has increased, but the steam and the material is not sufficiently mixed, the distillation efficiency is low. In addition, the material in the distiller is in the atmosphere of high temperature water steam for a long time, which is easy to lead to the decomposition of heat-sensitive and easily hydrolyzed compounds such as esters, ethers, amides, etc., resulting in the generation of impurities.

Contents of the invention

[0005] Aiming at the problems existing in the prior art, the utility model aims to provide a water vapor distillation equipment to improve the contact effect of steam and material, so as to reduce the amount of steam and improve the distillation effect. In addition, the time of material exposure to high temperature steam can be greatly reduced, the decomposition of heat-sensitive and easily deteriorated materials in contact with water can be reduced, the formation of impurities can be reduced, and the product quality and yield can be improved.

[0006] The utility model comprises a water vapor distillation equipment, wherein the middle of the distillation device is provided with a distillation area for distilling materials, which is characterized in that the upper part of the distillation device is provided with at least one material inlet pipe for introducing materials into the distillation area and at least one light component outlet for discharging light components in the materials, and the lower part of the distillation device is provided with a steam inlet to the distillation area The steam inlet and at least one recombination branch outlet for discharging the material in the recombination branch, the distillation area is equipped with a column pipe distributor for conveying the material from the material inlet to the distillation area, and the distillation area is provided with a hot medium inlet pipe for heating the material in the conveying pipeline system and a medium outlet for discharging the heat exchange medium.

[0007] the distiller comprises an upper head, a simplified head and a lower head, the upper head and the lower head are sealed fixedly in the upper and lower ends of the cylinder, wherein the upper head is provided with at least one material inlet pipe and at least one light component outlet, the lower head is provided with a steam inlet and at least one recombination branch outlet; The cylinder body cavity as a distillation area of the distiller, the simplified is provided with a first heating jacket, the upper head is provided with a second heating jacket outside, and the first heating jacket and the second heating jacket is connected, the first heating jacket is provided with a hot medium into the tube, the lower part of the medium outlet, so that the first heating jacket, the second heating jacket Aj through the heat exchange.

[0008] The output end of the material inlet pipe is equipped with a material distributor, the material distributor comprises a showerhead and a connecting pipe, wherein the outer wall of the showerhead is left between the inner wall of the showerhead and the inner wall of the distiller for light components through the gap, the inlet end of the showerhead and the output end of the material inlet pipe are sealed and connected, the bottom discharge hole of the showerhead faces the distillation area, and each discharge hole is equipped with a connecting pipe, the upper end of the connecting pipe The discharge hole corresponding to the showerhead is sealed and connected, and the lower end of the connecting pipe is connected with the inlet end of the column tube distributor

Through, so that the shower head, the connecting pipe and the tube distributor between the formation of material and light components mixing path.

[0009] the connecting pipe is a conical pipe with a small upper part and a large lower part.

[0010] The column tube distributor comprises a column tube and a lower sealing plate for conveying materials. The column tube runs through the entire distillation area and corresponds to the connecting tube. The upper end of the column tube is sealed and communicated with the lower end of the corresponding connecting tube, and the lower end of the column tube is extended and embedded to the mounting hole of the lower sealing plate at the bottom of the reactor.

[0011] The column tube is a cylindrical tube with smooth inner wall, and the upper and lower ends of the column tube are through, and the column tubes are parallel to each other.

[0012] The end of the light component outlet connected with the still is provided with a defroster.

[0013] The end of the steam inlet pipe connected with the still is provided with a steam distributor.

[0014] The steam distributor is a hollow cylinder sealed at the upper end, and the lower part of the cylinder is sealed and communicated with the output end of the steam inlet pipe. The side wall of the cylinder is provided with a number of steam through holes that can be communicated with the inner cavity of the cylinder.

[0015] The idea of the utility model is that a heating medium is passed into the shell program in advance to preheat the column tube. The steam inlet valve of the pipe is controlled to form a stable steam flow. Adjust the feed valve of the material inlet pipe to preheat the material (to specified temperature as needed) into the still and distribute it evenly through the material distributor. Under the action of gravity, the material flows down the inner wall of the column tube and forms a film. The water steam flows upward and forms a convection with the material, and the two are fully mixed and in contact. The light component moves upward with the water vapor and is discharged by the pipe light component outlet of the upper head. The recombination component continues to move downward and exits the cylinder through the pipe recombination component outlet of the lower head.

[0016] The utility model has the advantages that the material can be preheated according to the property of the material to improve the distillation effect. In addition, the water vapor distillation effect can be optimized by adjusting the feeding speed and changing the film thickness of the material. For materials with higher boiling point, vacuum distillation can be used to improve the distillation effect.

Illustration with picture

[0017] Figure 1 Schematic diagram of the utility model relates to a water vapor distillation device.

[00183] FIG. 2a is the main view of a showerhead of a material distributor of the utility model.

[0019] FIG. 2b is an upward view of the lotus head of the material distributor of the utility model.

[0020] Figure 2c is the structure diagram of the connecting pipe of the material distributor of the utility model.

[0021] Figure 3 is a schematic diagram of the line pipe distributor of the utility model.

[0022] FIG. 4 Schematic diagram of a steam distributor of the utility model.

[0023] FIG. 5a is the main view of the defrosting device of the material distributor of the utility model.

[0024] FIG. 5b is the expansion diagram of the defrosting device of the material distributor of the utility model.

Specific implementation mode

[0025] The utility model is further explained in combination with the attached drawings.

[0026] With reference to the attached drawings:

[0027] Embodiment 1 The utility model comprises a water vapor distillation equipment, which comprises a distillate 1, a distillate area for distilling materials in the middle of the distillate 1, an upper part of the distillate 1 is provided with at least one material inlet pipe 2 for introducing materials into the distillate area and at least one light component outlet 3 for discharging light components in the material, and a lower part of the distillate 1 is provided with a distillation area A steam inlet into the steam 4 and at least one recombination branch outlet 5 for discharging the recombination branch in the material, the distillation area is equipped with a column pipe distributor 6 for conveying the material from the material inlet to the distillation area, and the distillation area is provided with a hot medium inlet pipe 7 for heating the material in the conveying pipeline system and a medium outlet 8 for discharging the heat exchange medium.

[0028] the distiller 1 comprises an upper head 11, a simplified 12 and a lower head 13, the upper head 11 and the lower head 13 are respectively sealed and fixed on the upper and lower ends of the barrel 12, wherein the upper head 11 is provided with at least one material inlet pipe 2 and at least one light component outlet 3, the lower head 13 is provided with a steam inlet 4 and at least one recombination branch outlet 5; The barrel 12 cavity as a distillation area of the still, the barrel 12 is provided with a first heating jacket, the upper head is provided with a second heating jacket outside, and the first heating jacket and the second heating jacket is connected, the first heating jacket is provided with a hot medium into the tube 7, the lower part of the medium outlet 8, so that the first heating jacket, the second heating jacket can be passed into the heat exchange medium Quality.

[0029] The output end of the material inlet pipe 2 is arranged with a material distributor 9, the material distributor 9 comprises a showerhead 91 and a connecting pipe 92, wherein the outer wall of the showerhead 91 and the inner wall of the distiller 1 are provided with a gap for light components to pass through, the inlet end of the showerhead 91 is sealed and communicated with the output end of the material inlet pipe 2, and the bottom discharge hole of the showerhead 91 faces the distillation area, and each discharge The hole is equipped with a connecting pipe 92, connecting the upper end of the connecting pipe 92 and the discharge hole corresponding to the showerhead is sealed and connected, connecting the lower end of the connecting pipe 92 and the inlet end of the tube distributor 6 are connected, so that the showerhead, connecting pipe and the tube distributor form a mixed path between the material and the light components.

[0030] The connecting pipe 92 is a conical pipe with small upper and large lower, and the conical pipe is connected at both ends.

[0031] the column tube distributor 6 comprises a column tube 61 for conveying materials and a lower sealing plate 62. The column tube 61 runs through the entire distillation area and corresponds to the connecting pipe 92-a. The upper end of the column tube 61 is sealed and communicated with the lower end of the corresponding connecting pipe 92, and the lower end of the column tube 61 is extended and embedded to the mounting hole corresponding to the lower sealing plate 62 at the bottom of the reactor.

[0032] The column tube 61 is a cylindrical tube with a smooth inner wall, and the upper and lower ends of the column tube are connected, and the column tubes are parallel to each other.

[0033] The end of the light component outlet 3 connected with the distiller 1 is provided with a defroster 31.

[0034] The end of the steam inlet pipe 4 connected with the still is provided with a steam distributor 41.

[0035] The steam distributor 41 is a hollow cylinder sealed at the upper end, and the lower part of the cylinder is sealed and communicated with the output end of the steam inlet pipe 4. The side wall of the cylinder 4 is provided with a plurality of steam through holes 411 that can be communicated with the inner cavity of the cylinder.

[0036] Embodiment 2 sucrose benzoate distillation of toluene solvent:

[0037] The synthesized sucrose benzoate is reprocessed to obtain the toluene solution of sucrose benzoate. After removing most of the toluene by conventional distillation method, sucrose benzoate with a small amount of toluene solvent was obtained. Turn on the heat medium inlet pipe 7 and outlet pipe 8 and preheat the jacket to 120~130°C in cylinder 12. Control the vacuum inside the cylinder above -0.09Mpa. Open pipe steam inlet pipe 4. After forming a stable water steam flow, sucrose benzoate (preheated to 120~130 °C) is put into the water vapor distillation equipment by the material inlet tube 2, and the feed speed is adjusted to form a film in the column tube 61. The low component material exits from the light component outlet 3 to leave the simplified form, and the reconstituted sub-material exits from the pipe reconstituted sub-outlet 5 to leave the simplified form. The reconstituted sub-material is sucrose benzoate which is steamed and removed from toluene solvent. Toluene residue less than 10ppm.

[0038] Embodiment 3 Removal of methyl oleate from sucrose oleate:

[0039] The synthesized crude sucrose oleate contains about 5 to 10% methyl stearate. Turn on the heat medium inlet tube 7 and outlet tube 8 15 minutes in advance of the water vapor distillation equipment. Preheat the jacket to 100~110°C in the cylinder. Control the vacuum in the cylinder body above -0.095Mpa. Open pipe steam inlet pipe 4. After forming a stable water steam flow, the crude sucrose oleate (preheated to 120~130°C under nitrogen protection) is put into the water vapor distillation equipment through the material inlet tube 2, and the feed speed is adjusted to form a film in the column tube 61. The low component material exits from the light component outlet 3 to leave the simplified part, and the reconstituted sub-material exits from the reconstituted sub-outlet 5 to leave the simplified part. Collect high and low component materials separately. The low component collector collects water and methyl oleate, which is steamed away, while the high component collector obtains sucrose oleate. The HPLC content of sucrose oleate was 98.3%, and the residue of methyl ester was less than 1.5%.

[0040] The contents mentioned in the embodiments of this specification are only an enumeration of the realization forms of the idea of the utility model. The scope of protection of the utility model shall not be regarded as limited to the specific forms stated in the embodiments, and the scope of protection of the utility model shall also include

It includes equivalent technical means that can be thought of by a person skilled in the field according to the idea of the utility model.

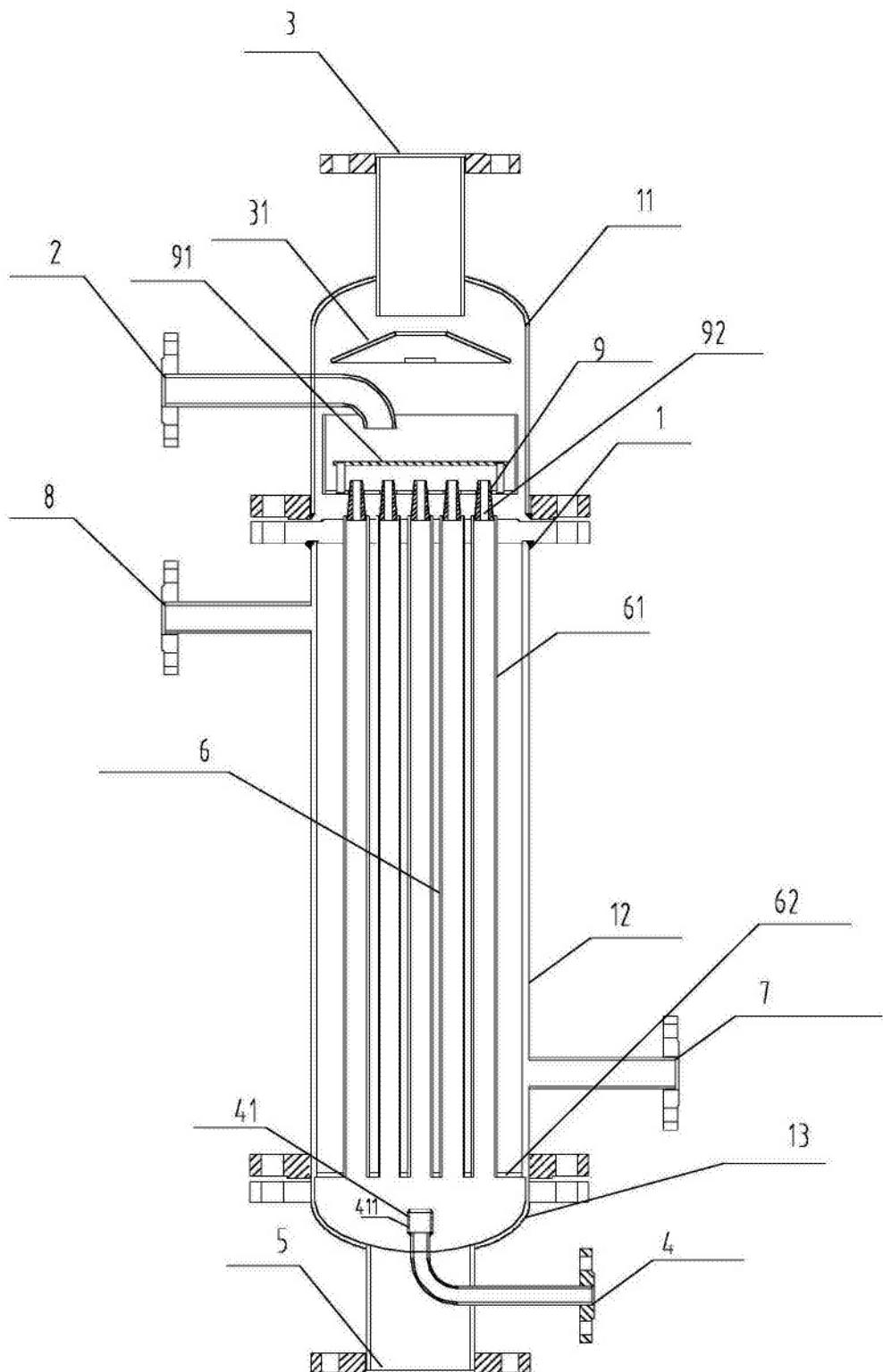


图 1

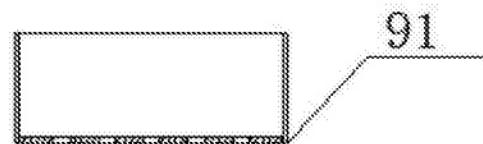


图2a

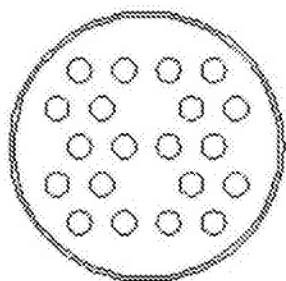


Figure 2b

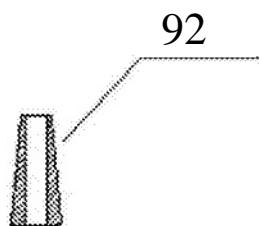


Figure 2c

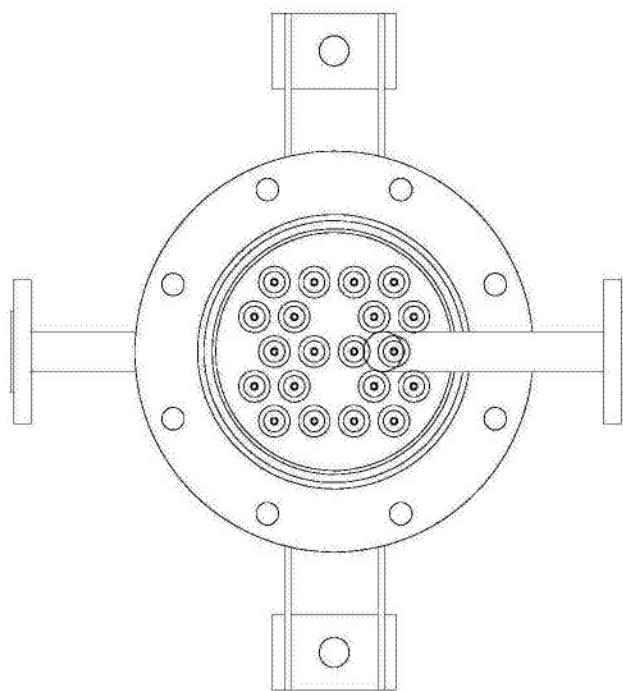


Figure 3

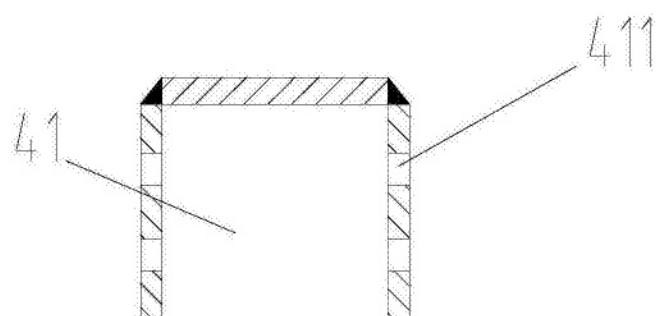


Figure 4

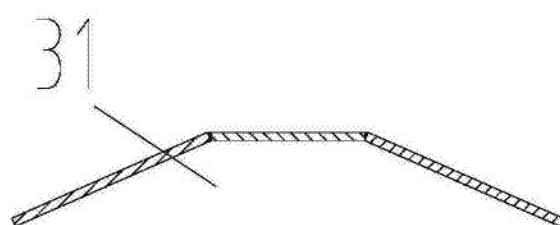


Figure 5.

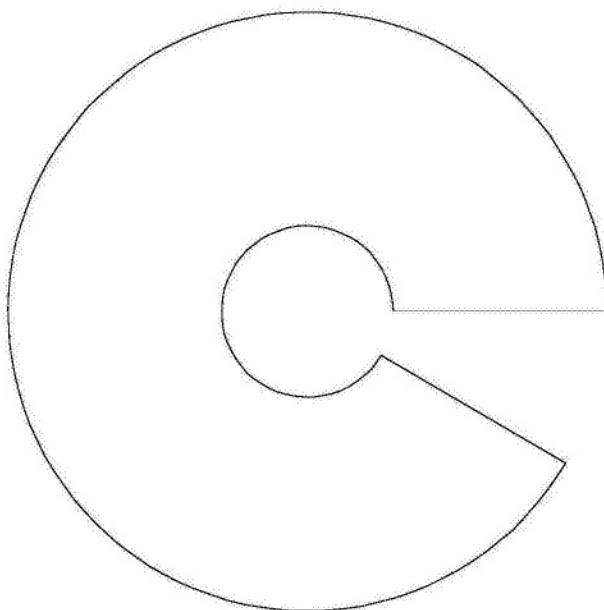


Figure 5b