LAUNDRY TREATING DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application is a nationalized application of International Application No. PCT/ CN2022/116242, filed on August 31, 2022, entitled "LAUNDRY TREATMENT APPARATUS", which claims priorities to Chinese Patent Application No. 202111023112.5 filed on September 1, 2021 and the Chinese patent application No. 202111450553.3 filed on November 30, 2021, the entire content of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of household appliances, and particularly, to a laundry treating device.

BACKGROUND

[0003] In daily life, people usually use an airing method to dry washed laundry. Airing laundry is greatly affected by weather factors, so effective drying of laundry is hardly achieved in humid and dark weather. Dryers are increasingly popular with consumers because they may dry washed laundry.

SUMMARY

[0004] It would be advantageous to provide a mechanism to mitigate, alleviate or even eliminate one or more of the above problems.

[0005] Embodiments of the present disclosure provide a laundry treating device. The laundry treating device includes: an inner tub configured to accommodate laundry to be treated; and a drying module assembly configured to dry the laundry, wherein the drying module assembly includes a moisture-absorbing passage, the moisture-absorbing passage including a first air inlet and a first air outlet, the first air inlet and the first air outlet being respectively communicated with the inner tub; a circulating fan disposed in the moisture-absorbing passage and configured to form a circulating airflow inside the inner tub and the moisture-absorbing passage; a regenerating passage; a regenerating fan disposed in the regenerating passage and configured to form a dehumidifying airflow inside the regenerating passage; a moisture-absorbing member disposed on the moisture-absorbing passage and the regenerating passage, the circulating airflow and the dehumidifying airflow both flowing through the moisture-absorbing member; and a driving mechanism configured to move the moisture-absorbing member relative to the moisture-

absorbing passage and the regenerating passage, wherein the moisture-absorbing member is configured to absorb moisture in the circulating airflow in the process of moving relative to the moisture-absorbing passage and the regenerating passage, and discharge the moisture through the dehumidifying airflow.

[0006] These and other aspects of the present disclosure will be clear according to embodiments described below and clarified with reference to the embodiments described below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] In the accompanying drawings, unless otherwise specified, identical symbols throughout a plurality of drawings indicate identical or similar components or elements. These accompanying drawings are not necessarily drawn to scale. It should be understood that these accompanying drawings only depict some embodiments disclosed in the present disclosure and should not be considered as limiting the scope of the present disclosure.

[0008] FIGs. 1 to 6 are schematic diagrams of an integrated washer-dryer according to some embodiments of the present disclosure, in which:

[0009] FIG. 1 is a perspective view of the integrated washer-dryer according to some embodiments of the present disclosure;

[0010] FIG. 2 is a sectional view of FIG. 1;

[0011] FIG. 3 is a locally enlarged view of FIG. 2;

[0012] FIG. 4 is an exploded view of FIG. 3;

[0013] FIG. 5 is an overall structural diagram of a drying module assembly;

[0014] FIG. 6 is a structural diagram of a temperature sensor, a moisture-absorbing passage and a regenerating passage;

[0015] FIGs. 7 to 43 are schematic diagrams of an integrated washer-dryer according to some embodiments of the present disclosure, in which:

[0016] FIGs. 7 to 9 are a perspective view, a rear view and a top view of the integrated washer-dryer respectively according to some embodiments of the present disclosure;

[0017] FIGs. 10 and 11 are a top view and a perspective view of the drying module assembly in FIG. 8 and FIG. 9, respectively;

[0018] FIG. 12 is a structural diagram of a lower housing of the drying module assembly;

[0019] FIGs. 13 to 15 are a top view, a bottom view and an exploded view of a circulating fan, respectively;

[0020] FIG. 16 is a structural diagram of a cooperating mode of the circulating fan and the lower housing of the drying module assembly;

sieve) against damage caused by collision with the upper peripheral clamping housing 2202 and the lower peripheral clamping housing 2203 in the rotation process.

[00124] According to some embodiments, as shown in FIG. 19 and FIG. 20, a first sealing ring 2205 is disposed at the junction between the upper peripheral clamping housing 2202 and the lower peripheral clamping housing 2203, or on the outer circumference of the respective upper peripheral clamping housing 2202 or on the outer circumference of the respective lower peripheral clamping housing 2203. The first sealing ring 2205 may be, for example, foam, soft rubber, wool strips and other materials. The first sealing ring 2205 may, on the one hand, seal the junction between the upper peripheral clamping housing 2202 and the lower peripheral clamping housing 2203, and on the other hand, form a rotating seal with a housing sealing ring 2724 disposed in the first mounting part 2720 of the lower housing 2700, such that the vast majority of moist airflow ascending from the inner tub may pass through the moisture-absorbing rotary plate 2201 to be moisture-absorbed, without leaking from a gap between the outer circumference of the moisture-absorbing rotary plate 2201 and the inner circumference of the lower housing 2700, thereby ensuring a moisture-absorbing effect.

[00125] According to some embodiments, as shown in FIG. 19 and FIG. 20, the moisture-absorbing member 2200 further includes an upper central clamp 2206, a lower central clamp 2207, and a central end surface shock absorber 2208. A first hole 2209 is defined in the center of the moisture-absorbing rotary plate 2201, a second hole 2210 is defined in the center of the upper central clamp 2206, and a third hole 2210 is defined in the center of the lower central clamp 2207. The upper central clamp 2206 and the lower central clamp 2207 pass through the first hole 2209 to clamp and the fix the moisture-absorbing rotary plate 2201. The clamping and fixing, for example, may be achieved by means of snaps, screws, adhesives, etc. A short shaft 2721 in the center of the first mounting part 2720 of the lower housing 2700 passes through the first hole 2209, the second hole 2210 and the third hole 2211, thereby connecting the moisture-absorbing member 2200 and the lower housing 2700 rotatably. The central end surface shock absorber 2208 is fitted over the lower central clamp 2207, and is located between the lower central clamp 2207 and the moisture-absorbing rotary plate 2201, and configured to protect the moisture-absorbing rotary plate 2201 against damage caused by friction with the lower central clamp 2207 in the rotation process.

[00126] According to some embodiments, as shown in FIG. 19 and FIG. 20, drive teeth are disposed on the outer circumference of the upper peripheral clamping housing 2202. It may be understood that in some other embodiments, the drive teeth may also be disposed on the outer circumference of the lower peripheral clamping housing 2203. The driving mechanism 2300 may

the fan-shaped housing 2510. Correspondingly, the diameters of the plurality of air holes 2521 in the mesh plate 2520 decrease along a direction from the circumference of the sector-shaped housing to the center of the circle (as indicated by arrows in FIG. 35), thereby adjusting the air volume. Therefore, the dehumidifying airflow may be heated evenly by the heating pipe 2530.

[00159] In some other embodiments (not shown in FIGs. 34 to 36), the air inlet 2540 may also be formed in the radius side of the sector-shaped housing 2510. In this case, the dehumidifying airflow flows in a direction approximately perpendicular to the radius inside the sector-shaped housing 2510 (i.e., a circumferential direction), in other words, along a direction from the radius side where the air inlet is located to the other radius side of the sector-shaped housing 2510. Correspondingly, the diameters of the plurality of air holes 2521 in the mesh plate 2520 decrease along the direction from the radius side where the air inlet is located to another radius side. Therefore, the volume of air flowing through the mesh plate 2520 may be adjusted, such that the dehumidifying airflow may be heated evenly by the heating pipe 2530. Further, the heated high-temperature dehumidifying airflow evenly dehumidifies the regenerating region of the moisture-absorbing rotary plate, thereby improving the dehumidifying effect.

[00160] According to some embodiments, as shown in FIG. 36, the heating pipe 2530 is not disposed directly below the air holes 2521, but is offset towards a center of the sector-shaped housing relative to the air holes 2521. Due to a certain offset of the position of the heating pipe 2530 relative to the air holes 2521, the heating pipe 2530 will not form a large resistance to the dehumidifying airflow flowing through the air holes 2521. Further, the dehumidifying airflow has a velocity along a direction from the circumference of the sector-shaped housing to the center of the circle (as indicated by arrows in FIG. 35) when the dehumidifying airflow enters the air inlet 2540 and flows through the air holes 2521. The heating pipe 2530 is disposed at a position offset towards the center of the sector-shaped housing relative to the air holes 2521, the dehumidifying airflow flowing through the air holes 2521 may be directly opposite to the heating pipe 2530, thereby improving the heating efficiency of the heating pipe 2530 to the dehumidifying airflow.

[00161] According to some embodiments, as shown in FIG. 34 and FIG. 36, the lower wall of the sector-shaped housing 2510 extends outward to form a third mounting part 2550. It may be understood that the third mounting part may also be disposed at the other position, such as on a sidewall of the sector-shaped housing 2510. The heating assembly 2500 further includes a temperature sensor 2560. The temperature sensor 2560 is disposed on the third mounting part 2550.

terms "first", "second" and "third" may include one or more of the features either explicitly or implicitly. In the description of the present disclosure, unless otherwise stated, the term "a plurality of" means two or more.

[00236] In the present disclosure, unless otherwise definitely specified and limited, the terms "mounted", "connection", "connected", "fixed", and the like need to be broadly understood, for example, connection may be fixed connection, or detachable connection or integrated connection; or may be mechanical connection, or electrical connection, or communication; or may be direct connection, or indirect connection via an intermediation, or communication of inner parts of two elements, or an interaction relationship between two elements. A person of ordinary skill in the art may understand the specific meaning of the above terms in the present disclosure in accordance with specific conditions.

[00237] In the present disclosure, unless otherwise definitely specified and limited, the first feature being provided "above" or “below" the second feature may mean that the first feature is in direct contact with the second feature, or mean that the first and second features are not in direct contact, but via an additional feature therebetween. Moreover, the first feature being provided "over", "above", and "on" the second feature may mean that the first feature is provided directly above, or above and staggered from the second feature, or merely means that a level of the first feature is higher than the second feature. The first feature being provided "under", "below", and "beneath" the second feature may mean that the first feature is provided directly below, or below and staggered from the second feature, or merely means that a level of the first feature is lower than the second feature.

[00238] A laundry treating device is provided and includes

[00239] an inner tub, configured to accommodate laundry to be treated; and

[00240] a drying module assembly, configured to dry the laundry, where the drying module assembly includes:

[00241] a moisture-absorbing passage, including a first air inlet and a first air outlet, where the first air inlet and the first air outlet are communicated with the inner tub respectively;

[00242] a circulating fan, disposed inside the moisture-absorbing passage and configured to form a circulating airflow inside the inner tub and the moisture-absorbing passage;

[00243] a regenerating passage;

[00244] a regenerating fan, disposed inside the regenerating passage and configured to form a dehumidifying airflow inside the regenerating passage;

[00245] a moisture-absorbing member, disposed on the moisture-absorbing passage and the regenerating passage, the circulating airflow and the dehumidifying airflow both flowing through the moisture-absorbing member; and

[00246] a driving mechanism, configured to move the moisture-absorbing member relative to the moisture-absorbing passage and the regenerating passage,

[00247] where the moisture-absorbing member is configured to absorb moisture in the circulating airflow in the process of moving relative to the moisture-absorbing passage and the regenerating passage, and discharge the moisture absorbed through the dehumidifying airflow;

[00248] where the drying module assembly further includes a dehumidifying assembly, and the dehumidifying assembly is disposed on the regenerating passage.

[00249] In some embodiments, the moisture-absorbing member is provided with a moisture absorbent, the moisture absorbent includes at least one of zeolite, alkali metal aluminosilicate, lithium chloride, silica gel, modified silica gel or activated alumina; and

[00250] the dehumidifying assembly is configured to desorb moisture absorbed by the moisture absorbent, and the dehumidifying assembly including at least one of a heating assembly, an ultrasonic generator or a microwave generator.

[00251] In some embodiments, the moisture-absorbing member includes a moisture-absorbing rotary plate; the driving mechanism is configured to drive the moisture-absorbing rotary plate to rotate relative to the moisture-absorbing passage and the regenerating passage; the moisture-absorbing rotary plate includes a moisture-absorbing region and a regenerating region, where the moisture-absorbing region is a region on the moisture-absorbing rotary plate through which the circulating airflow flows, and the regenerating region is a region on the moisture-absorbing rotary plate through which the dehumidifying airflow flows; and

[00252] the drying module assembly further includes a heating assembly disposed on the regenerating passage and covering the regenerating region.

[00253] In some embodiments, the moisture-absorbing member further includes an upper peripheral clamping housing, a lower peripheral clamping housing and a circumferential shock absorber, where the circumferential shock absorber is disposed on an outer circumference of the moisture-absorbing rotary plate or an inner circumference of the housing, and the moisture-absorbing rotary plate and the circumferential shock absorber are clamped and fixed by the upper peripheral clamping housing and the lower peripheral clamping housing.

[00254] In some embodiments, a first sealing ring is disposed on an outer circumference of a junction between the upper peripheral clamping housing and the lower peripheral clamping housing.

[00255] In some embodiments, drive teeth are disposed on an outer circumference of the upper peripheral clamping housing or an outer circumference of the lower peripheral clamping housing; and

[00256] the driving mechanism is a drive motor, a gear is disposed on an output end of the drive motor, and the gear is meshed with the drive teeth to drive the moisture-absorbing member to rotate.

[00257] In some embodiments, the drying module assembly includes a lower housing, the lower housing is provided with a first mounting part for mounting the moisture-absorbing member, and a first roller is disposed on an inner sidewall of the first mounting part; and

[00258] an auxiliary rotating ring is disposed on the outer circumference of the upper peripheral clamping housing or the outer circumference of the lower peripheral clamping housing, and the auxiliary rotating ring is in rolling fit with the first roller.

[00259] In some embodiments, a second roller is disposed on a bottom surface of the first mounting part, and is in rolling fit with a lower surface of the lower peripheral clamping housing.

[00260] In some embodiments, a short shaft is disposed in a center of the first mounting part;

[00261] the moisture-absorbing member further includes an upper central clamp, a lower central clamp, and a central end surface shock absorber;

[00262] a first hole is defined in a center of the moisture-absorbing rotary plate, a second hole is defined in a center of the upper central clamp, and a third hole is defined in a center of the lower central clamp; and

[00263] the upper central clamp and the lower central clamp pass through the first hole to clamp and fix the moisture-absorbing rotary plate; the short shaft passes through the second hole and the third hole, so as to connect the moisture-absorbing member and the lower housing rotatably; and the central end surface shock absorber is disposed between the lower central clamp and the moisture-absorbing rotary plate.

[00264] In some embodiments, the moisture-absorbing rotary plate further includes a cooling region; and the cooling region is located downstream of the regenerating region and upstream of the moisture-absorbing region along a rotation direction of the moisture-absorbing rotary plate.

[00265] In some embodiments, the drying module assembly includes a lower housing and an upper housing, where the lower housing is provided with a first mounting part for mounting the moisture-absorbing member, the upper housing is provided with a second mounting part for

mounting the moisture-absorbing member, and the moisture-absorbing member is rotatably connected inside a space defined by the first mounting part and the second mounting part; and

[00266] the first mounting part is provided with a first separator, the second mounting part is provided with a second separator, the second separator is located directly above the first separator, and the first separator and the second separator separate the moisture-absorbing rotary plate into the moisture-absorbing region and the regenerating region.

[00267] In some embodiments, the first mounting part is further provided with a third separator configured to separate a circulating airflow that flows into the moisture-absorbing region.

[00268] In some embodiments, a first sealing member is disposed between the moisture-absorbing member and the first separator, and fixed on an upper end surface of the first separator.

[00269] In some embodiments, a second sealing member is disposed between the moisture-absorbing member and the second separator, and the second sealing member is fixed on a lower end surface of the second separator and located directly above the first sealing member.

[00270] In some embodiments, an end surface, opposite to the moisture-absorbing member, of one of the first separator and the second separator is provided with a sealing member, and an end surface, opposite to the moisture-absorbing member, of the other of the first separator and the second separator is not provided with a sealing member and the other of the first separator and the second separator is spaced apart from the moisture-absorbing member by a preset distance.

[00271] In some embodiments, an end surface, opposite to the moisture-absorbing member, of one of the first separator and the second separator is provided with a first sealing member, and the first sealing member is in contact with the moisture-absorbing member; and

[00272] an end surface, opposite to the moisture-absorbing member, of the other of the first separator and the second separator is provided with a second sealing member, the second sealing member is spaced apart from the moisture-absorbing member by a preset distance.

[00273] In some embodiments, the drying module assembly includes an upper housing, the heating assembly is disposed on the upper housing, and a heat shield ring and a second sealing ring are disposed between the heating assembly and the upper housing.

[00274] In some embodiments, the heating assembly includes a sector-shaped housing, and a mesh plate and a heating pipe which are disposed in the sector-shaped housing, the heating pipe being disposed below the mesh plate, and the mesh plate including a plurality of air holes; and

[00275] an air inlet is defined in a circumferential side or a radius side of the sector-shaped housing, and the dehumidifying airflow flows through the air inlet, the plurality of air holes in the mesh plate and the heating pipe in sequence, and to the regenerating region.

[00276] In some embodiments, diameters of the plurality of air holes decrease along a flow direction of the dehumidifying airflow.

[00277] In some embodiments, the heating pipe is offset towards a center of the sector-shaped housing relative to the plurality of air holes.

[00278] In some embodiments, a third mounting part is formed on a sidewall of the sector-shaped housing or a lower wall of the sector-shaped housing extends outward to form a third mounting part; and

[00279] the heating assembly further includes a temperature sensor disposed on the third mounting part.

[00280] In some embodiments, the device further includes a filter, where the filter is disposed at at least one of:

[00281] upstream of the moisture-absorbing member in the moisture-absorbing passage, upstream of the regenerating fan in the regenerating passage, or downstream of the moisture-absorbing member in the regenerating passage.

[00282] In some embodiments, the device further includes a cleaning assembly configured to clean the filter automatically, the cleaning assembly including at least one of:

[00283] a spraying mechanism configured to spray the filter, a vibration mechanism configured to vibrate the filter, an air blowing mechanism configured to blow air to the filter, or a scraping mechanism configured to scrape the filter.

[00284] In some embodiments, the cleaning assembly includes a spraying mechanism, where the spraying mechanism is disposed downstream of the filter and a flow direction of a liquid sprayed by the spraying mechanism is opposite to a direction of an airflow flowing through the filter.

[00285] In some embodiments, the filter includes a filter screen disposed obliquely inside the moisture-absorbing passage and the regenerating passage; and

[00286] the spraying mechanism includes a water outlet pipe and a nozzle, where a first end of the nozzle is connected to the water outlet pipe, and a second end of the nozzle is flat and covers an end of the filter screen close to the water outlet pipe.

[00287] In some embodiments, the moisture-absorbing member includes a first moisture-absorbing member and a second moisture-absorbing member, and the driving mechanism is configured to enable the first moisture-absorbing member and the second moisture-absorbing

member to be located on the moisture-absorbing passage and the regenerating passage alternately.

[00288] In some embodiments, the moisture-absorbing member includes a moisture-absorbing strip, and the driving mechanism is configured to drive the moisture-absorbing strip to perform a linear motion relative to the moisture-absorbing passage and the regenerating passage.

[00289] In some embodiments, the device further includes a housing, where a side surface of the housing is provided with a second air inlet and a second air outlet, the second air inlet being communicated with an air inlet end of the regenerating passage, and the second air outlet being communicated with an air outlet end of the regenerating passage.

[00290] In some embodiments, a condenser is disposed in at least one of the air inlet end or the air outlet end.

[00291] In some embodiments, a condenser is disposed downstream of the moisture-absorbing member in the regenerating passage, an air outlet of the condenser being communicated with an air inlet of the regenerating fan, such that the regenerating passage forms a closed loop.

[00292] In some embodiments, a condenser is disposed between an air outlet of the inner tub and the moisture-absorbing member.

[00293] In some embodiments, the condenser includes a serpentine pipe configured to circulate condensate water.

[00294] In some embodiments, the device further includes a housing, where the drying module assembly includes a lower housing provided with a fourth mounting part, and the fourth mounting part is fixed to the housing in a lap joint manner such that the drying module assembly is fixed on the housing.

[00295] In some embodiments, the first air inlet and the first air outlet are connected to the inner tub through flexible pipes, respectively.

[00296] The present description provides many different embodiments or examples that may be used to implement the present disclosure. It should be understood that these different embodiments or examples are entirely exemplary. Therefore, the protection scope of the present disclosure should be subject to the protection scope defined by the appended claims.

WHAT IS CLAIMED IS:

1. A laundry treating device, comprising:

an inner tub, configured to accommodate laundry to be treated; and

a drying module assembly, configured to dry the laundry, wherein the drying module assembly comprises:

a moisture-absorbing passage, comprising a first air inlet and a first air outlet, wherein the first air inlet and the first air outlet are communicated with the inner tub respectively;

a circulating fan, disposed inside the moisture-absorbing passage and configured to form a circulating airflow inside the inner tub and the moisture-absorbing passage;

a regenerating passage;

a regenerating fan, disposed inside the regenerating passage and configured to form a dehumidifying airflow inside the regenerating passage;

a moisture-absorbing member, disposed on the moisture-absorbing passage and the regenerating passage, the circulating airflow and the dehumidifying airflow both flowing through the moisture-absorbing member; and

a driving mechanism, configured to move the moisture-absorbing member relative to the moisture-absorbing passage and the regenerating passage,

wherein the moisture-absorbing member is configured to absorb moisture in the circulating airflow in the process of moving relative to the moisture-absorbing passage and the regenerating passage, and discharge the moisture absorbed through the dehumidifying airflow;

wherein the drying module assembly further comprises a dehumidifying assembly, and the dehumidifying assembly is disposed on the regenerating passage.

2. The device according to claim 1, wherein

the moisture-absorbing member is provided with a moisture absorbent, the moisture absorbent comprises at least one of zeolite, alkali metal aluminosilicate, lithium chloride, silica gel, modified silica gel or activated alumina; and

the dehumidifying assembly is configured to desorb moisture absorbed by the moisture absorbent, and the dehumidifying assembly comprising at least one of a heating assembly, an ultrasonic generator or a microwave generator.

3. The device according to claim 1 or 2, wherein

the moisture-absorbing member comprises a moisture-absorbing rotary plate; the driving mechanism is configured to drive the moisture-absorbing rotary plate to rotate relative to the

moisture-absorbing passage and the regenerating passage; the moisture-absorbing rotary plate comprises a moisture-absorbing region and a regenerating region, wherein the moisture-absorbing region is a region on the moisture-absorbing rotary plate through which the circulating airflow flows, and the regenerating region is a region on the moisture-absorbing rotary plate through which the dehumidifying airflow flows; and

the drying module assembly further comprises a heating assembly disposed on the regenerating passage and covering the regenerating region.

4. The device according to claim 3, wherein the moisture-absorbing member further comprises an upper peripheral clamping housing, a lower peripheral clamping housing and a circumferential shock absorber, wherein the circumferential shock absorber is disposed on an outer circumference of the moisture-absorbing rotary plate or an inner circumference of the housing, and the moisture-absorbing rotary plate and the circumferential shock absorber are clamped and fixed by the upper peripheral clamping housing and the lower peripheral clamping housing.

5. The device according to claim 4, wherein a first sealing ring is disposed on an outer circumference of a junction between the upper peripheral clamping housing and the lower peripheral clamping housing.

6. The device according to claim 4 or 5, wherein

drive teeth are disposed on an outer circumference of the upper peripheral clamping housing or an outer circumference of the lower peripheral clamping housing; and

the driving mechanism is a drive motor, a gear is disposed on an output end of the drive motor, and the gear is meshed with the drive teeth to drive the moisture-absorbing member to rotate.

7. The device according to any one of claims 4 to 6, wherein

the drying module assembly comprises a lower housing, the lower housing is provided with a first mounting part for mounting the moisture-absorbing member, and a first roller is disposed on an inner sidewall of the first mounting part; and

an auxiliary rotating ring is disposed on the outer circumference of the upper peripheral clamping housing or the outer circumference of the lower peripheral clamping housing, and the auxiliary rotating ring is in rolling fit with the first roller.

8. The device according to claim 7, wherein a second roller is disposed on a bottom surface of the first mounting part, and is in rolling fit with a lower surface of the lower peripheral clamping housing.

9. The device according to claim 7 or 8, wherein

a short shaft is disposed in a center of the first mounting part;

the moisture-absorbing member further comprises an upper central clamp, a lower central clamp, and a central end surface shock absorber;

a first hole is defined in a center of the moisture-absorbing rotary plate, a second hole is defined in a center of the upper central clamp, and a third hole is defined in a center of the lower central clamp; and

the upper central clamp and the lower central clamp pass through the first hole to clamp and fix the moisture-absorbing rotary plate; the short shaft passes through the second hole and the third hole, so as to connect the moisture-absorbing member and the lower housing rotatably; and the central end surface shock absorber is disposed between the lower central clamp and the moisture-absorbing rotary plate.

10. The device according to any one of claims 3 to 9, wherein the moisture-absorbing rotary plate further comprises a cooling region; and the cooling region is located downstream of the regenerating region and upstream of the moisture-absorbing region along a rotation direction of the moisture-absorbing rotary plate.

11. The device according to claim 3, wherein

the drying module assembly comprises a lower housing and an upper housing, wherein the lower housing is provided with a first mounting part for mounting the moisture-absorbing member, the upper housing is provided with a second mounting part for mounting the moisture-absorbing member, and the moisture-absorbing member is rotatably connected inside a space defined by the first mounting part and the second mounting part; and

the first mounting part is provided with a first separator, the second mounting part is provided with a second separator, the second separator is located directly above the first separator, and the first separator and the second separator separate the moisture-absorbing rotary plate into the moisture-absorbing region and the regenerating region.

12. The device according to claim 11, wherein the first mounting part is further provided with a third separator configured to separate a circulating airflow that flows into the moisture-absorbing region.

13. The device according to claim 11 or 12, wherein a first sealing member is disposed between the moisture-absorbing member and the first separator, and fixed on an upper end surface of the first separator.

14. The device according to claim 13, wherein a second sealing member is disposed between the moisture-absorbing member and the second separator, and the second sealing member is fixed on a lower end surface of the second separator and located directly above the first sealing member.

15. The device according to claim 11 or 12, wherein an end surface, opposite to the moisture-absorbing member, of one of the first separator and the second separator is provided with a sealing member, and an end surface, opposite to the moisture-absorbing member, of the other of the first separator and the second separator is not provided with a sealing member and the other of the first separator and the second separator is spaced apart from the moisture-absorbing member by a preset distance.

16. The device according to claim 11 or 12, wherein an end surface, opposite to the moisture-absorbing member, of one of the first separator and the second separator is provided with a first sealing member, and the first sealing member is in contact with the moisture-absorbing member; and

an end surface, opposite to the moisture-absorbing member, of the other of the first separator and the second separator is provided with a second sealing member, the second sealing member is spaced apart from the moisture-absorbing member by a preset distance.

17. The device according to claim 3, wherein the drying module assembly comprises an upper housing, the heating assembly is disposed on the upper housing, and a heat shield ring and a second sealing ring are disposed between the heating assembly and the upper housing.

18. The device according to claim 3 or 17, wherein

the heating assembly comprises a sector-shaped housing, and a mesh plate and a heating pipe which are disposed in the sector-shaped housing, the heating pipe being disposed below the mesh plate, and the mesh plate comprising a plurality of air holes; and

an air inlet is defined in a circumferential side or a radius side of the sector-shaped housing, and the dehumidifying airflow flows through the air inlet, the plurality of air holes in the mesh plate and the heating pipe in sequence, and to the regenerating region.

19. The device according to claim 18, wherein diameters of the plurality of air holes decrease along a flow direction of the dehumidifying airflow.

20. The device according to claim 18 or 19, wherein the heating pipe is offset towards a center of the sector-shaped housing relative to the plurality of air holes.