CLAIMS

1. A linear module, comprising a casing and a linear transmission device, wherein the casing has an internal cavity in which the linear transmission device is at least partially disposed, the casing defines thereon an output opening which extends along a movement direction of the linear transmission device, a sealing band is provided at the output opening, wherein the linear module further comprises a first rolling mechanism and second rolling mechanism that are moveable in synchronization with the linear transmission device, the first rolling mechanism is arranged on a side of the sealing band that is away from the internal cavity, the second rolling mechanism is arranged on a side of the sealing band that faces towards the internal cavity, and the first rolling mechanism and the second rolling mechanism are in rolling contact with the sealing band;

wherein the linear transmission device comprises a slide table configured for linear movement, the first rolling mechanism and the second rolling mechanism are each arranged on and in rolling connection with the slide table; the first rolling mechanism is disposed close to an edge of the slide table and the second rolling mechanism is disposed inside the slide table, and the first rolling mechanism is close to the second rolling mechanism.

2. The linear module of claim 1, wherein a number of the second rolling mechanism is one and a number of the first rolling mechanisms is more than one, wherein the first rolling mechanisms are disposed symmetrically on opposing sides of the second rolling mechanism along the movement direction of the linear transmission device.

3. The linear module of claim 2, wherein the number of the first rolling mechanisms is two.

4. The linear module of claim 1, wherein

a number of the second rolling mechanisms is more than one, wherein the second rolling mechanisms are spaced apart from one another along the movement direction of the linear transmission device;

a number of the first rolling mechanisms is two, wherein the first rolling mechanisms are disposed symmetrically on opposing sides of the second rolling mechanisms along the movement direction of the linear transmission device.

5. The linear module of claim 4, wherein the number of the second rolling mechanisms is two.

6. The linear module of claim 1, wherein the slide table comprises an adapter and a slide block fixed to the adapter, and wherein the second rolling mechanism and the first rolling mechanism are arranged on the adapter and/or the slide block.

7. The linear module of claim 1, wherein the first rolling mechanism comprises a first wear-resistant rolling member which is in rolling contact with the sealing band, and the first wear-resistant rolling member is made of a magnetic wear-resistant material.

8. The linear module of claim 7, wherein the first rolling mechanism further comprises first bearing adjusting nuts, first bearings, first stop rings and a first support shaft, wherein the first bearings are sleeved over respective ends of the first support shaft and are fixed to the slide table, the first wear-resistant rolling member is fixed over the first support shaft, each of the first stop rings is sleeved over the first support shaft and is closer to the first wear-resistant rolling member and is configured to fix an outer ring of a corresponding one of the first bearings, each of the first bearing adjusting nuts is sleeved over the first support shaft and is farther away from the first wear-resistant rolling member and is configured to fix an inner ring of a corresponding one of the first bearings.

9. The linear module of claim 1, wherein the second rolling mechanism

comprises a second wear-resistant rolling member which is in rolling contact with the sealing band, and the second wear-resistant rolling member is made of a lightweight wear-resistant material.

10. The linear module of claim 9, wherein the second rolling mechanism further comprises second bearing adjusting nuts, second bearings, second stop rings and a second support shaft, wherein the second bearings are sleeved over respective ends of the second support shaft and are fixed to the slide table, the second wear-resistant rolling member is fixed over the second support shaft, each of the second stop rings is sleeved over the second support shaft and is closer to the second wear-resistant rolling member and is configured to fix an outer ring of a corresponding one of the second bearings, each of the second bearing adjusting nuts is sleeved over the second support shaft and is farther away from the second wear-resistant rolling member and is configured to fix an inner ring of a corresponding one of the second bearing.

11. The linear module of claim 1, wherein the casing comprises a base and a cover arranged on the base, the internal cavity is formed between the base and the cover, the cover is provided with magnetic strips extending on both sides of the output opening along the movement direction of the linear transmission device, and the sealing band covers at least a part of each of the magnetic strips.

12. The linear module of claim 11, wherein the cover is provided with a front holder and a rear holder, and wherein the linear transmission device comprises a lead screw, a nut, a guide rail and bearings, all disposed within the casing, and a slide table disposed at least partially outside the casing, one end of the lead screw is disposed at the front holder via one of the bearings and extends through the front holder and is coupled to a driving apparatus arranged outside the casing, a further end of the lead screw is rotatably connected with the rear holder via a further one of the

bearings, the nut is movably disposed over the lead screw and is connected to the slide table, the guide rail is disposed on the base, and the slide table is movably disposed on the guide rail.

13. An operating method of a linear module, wherein the linear module comprises a casing, a linear transmission device, a first rolling mechanism and a second rolling mechanism, wherein the casing has an internal cavity in which the linear transmission device is at least partially disposed, the casing defines thereon an output opening and a sealing band is provided at the output opening; the linear transmission device comprises a slide table configured for linear movement, the first rolling mechanism and the second rolling mechanism are each arranged on and in rolling connection with the slide table; the first rolling mechanism is disposed close to an edge of the slide table and the second rolling mechanism is disposed inside the slide table, the first rolling mechanism is close to the second rolling mechanism;

wherein the operating method comprises:

causing the first rolling mechanism to move in synchronization with the linear transmission device, during which the first rolling mechanism rolls relative to the sealing band; and

pressing, by the first rolling mechanism, a portion of the sealing band that is interacting with the linear transmission device toward the internal cavity;

causing the second rolling mechanism to move in synchronization with the linear transmission device, during which the second rolling mechanism rolls relative to the sealing band; and

lifting, by the second rolling mechanism, a portion of the sealing band that comes into contact with the second rolling mechanism, from the output opening in a direction away from the internal cavity, to form a gap.