The invention claimed is:

1. A carrier device for providing friction damping and having a carrying end (4) for bearing a load or stress and a first contact structure (7) opposite the carrying end (4) for contacting a terminal support body (5), comprising:

a first force-receiving structure (1) that includes said first contact structure (7) that provides a first friction damping when in contact with the terminal support body (5);

a second force-receiving structure (2) displaceable with a second contact structure (8) that provides a second friction damping when in contact with the terminal support body (5), the first friction damping provided by the first contact structure (7) being lower than the second friction damping provided by the second contact structure (8);

a limiting structure (11) linked to the second force-receiving structure (2);

a pre-stressed structure (3) provided between the limiting structure (11) and the first force-receiving structure (1), wherein:

when a pressure resulting from the load or stress on the carrying end (4) is less than a preset value is applied to the carrying end (4), the pre-stressed structure (3) prevents transmission of the lower pressure to the limiting structure (11) and responsive displacement of the second force-receiving structure (2), so that only the first contact structure (7) contacts the terminal support body (5) to provide said first lower friction damping, and

when the pressure resulting from the load or stress on the carrying end (4) is greater than the preset value is applied to the carrying end (4), the greater pressure is transmitted by the pre-stressed structure (3) to cause transmission of the higher pressure to the limiting structure (11) and responsive

displacement of the second force-receiving structure (2), thereby causing the second contact structure (8) to contact the terminal support body (5) and provide said second higher friction damping;

wherein the first contact structure (7) having the first lower friction damping is one of a terminal block (71) having a low coefficient of sliding friction, a rolling wheel (72), and a rolling ball (73);

wherein the pre-stressed structure (3) includes a magnetic device;

wherein load or stress on the carrying end (4) is a sum of a weight of the carrier device and a load (6) applied to the carrier end (4) and/or a pressure applied to the carrier end (4).

2. A carrier device as claimed in claim 1, wherein:

the pre-stressed structure (3) is a magnetic device (31) and the first contact structure (7) is provided on a terminal block (71) movably positioned within an inner space of the second force-receiving structure (2),

the magnetic device (31) includes first and second magnets respectively connected to the force limiting structure (11) and the terminal block (71), said first and second magnets having same polarities to provide mutual magnetic repulsion, and

movement of the terminal block (71) within the inner space of the second force-receiving structure (2) is limited by a coupled axial displacement limiting structure of the terminal block (71) and the second force-receiving structure (2).

3. A carrier device as claimed in claim 2, wherein the coupled axial displacement limiting structure includes a guide slot (731) in the first force-receiving structure (1) and a pin (721) extending from the second force-

receiving structure (2) into the guide slot (731).

4. A carrier device as claimed in claim 1, wherein the first contact structure (7) having the first lower friction damping is a surface of the terminal block (71) having a low coefficient of sliding friction.

5. A carrier device as claimed in claim 1, wherein the first contact structure (7) is a rolling wheel (72) mounted to the first force-receiving structure (1) by a shaft (723) and a bearing (720).

6. A carrier device as claimed in claim 1, wherein the first contact structure (7) is a rolling ball (73) captured by a ring (730) installed in an inner side of a lower opening in the second force-receiving structure (2).

7. A carrier device as claimed in claim 6, further comprising an intermediate abrasion-reducing pad (735) provided between the magnetic device (31) and the rolling ball (73).

8. A carrier device as claimed in claim 1, wherein the pre-stressed structure (3) and first force-receiving structure (1) are assembled to an auxiliary structure (81) having a flange (82) that extends under a base of the second force-receiving structure (2) and that includes the second contract structure (8), wherein the carrying end (4) is situated at a top end of the second force-receiving structure (2), the limiting structure (11) is at a top end of the auxiliary structure (81), and the limiting structure (11) is in contact with the second force-receiving structure (2), wherein the pre-stressed structure (3) resists displacement of the limiting structure (11), auxiliary structure (81), and second force-receiving structure (2) when the load or

stress on the carrying end (4) is less than the preset value and permits the displacement of the limiting structure (11), auxiliary structure (81), and second force-receiving structure (2) when the load or stress on the carrying end (4) exceeds the preset value.

9. A carrier device as claimed in claim 8, wherein the auxiliary structure (81) is assembled to the second force-receiving structure (2) by at least one of the following:

by the auxiliary structure (81) being press-fit into the second force-receiving structure (2),

by combining mating spiral structures on the auxiliary structure (81) and the second force-receiving structure (2),

by a pin that passes laterally through the auxiliary structure (81) and the second force-receiving structure (2),

by at least one screw,

by welds, and

by being bonded together.

10. A carrier device as claimed in claim 8, wherein:

the pre-stressed structure (3) is a magnetic device (31) and the first contact structure (7) is provided on a terminal block (71) movably positioned within an inner space of the auxiliary structure (81),

the magnetic device (31) includes first and second magnets respectively connected to the force limiting structure (11) and the terminal block (71), said

first and second magnets having same polarities to provide mutual magnetic repulsion, and

movement of the terminal block (71) within the inner space of the auxiliary structure (81) is limited by a coupled axial displacement limiting structure of the terminal block (71) and the auxiliary structure (81).

11. A carrier device as claimed in claim 1, wherein:

the second contact structure (8) includes a tubular outer auxiliary structure (83) having a first end attached to an outer periphery of the second force-receiving structure (2) and a second end that provides the second higher friction damping,

the pre-stressed structure (3) is a magnetic device (31) and the first contact structure (7) includes a semi-spherical terminal block (70a) movably positioned within an inner space of the outer auxiliary structure (83),

the magnetic device (31) includes first and second magnets respectively connected to the force limiting structure (11) and the semi-spherical terminal block (70a), and

movement of the semi-spherical terminal block (70a) within the inner space of the outer auxiliary structure (83) is limited by a coupled axial displacement limiting structure of the semi-spherical terminal block (70a) and the second force-receiving structure (2).

12. A carrier device as claimed in claim 11, wherein the coupled axial displacement limiting structure includes a flange (70b) extending outwardly from a top of the semi-spherical terminal block (70a) and a shoulder (84) extending inwardly from the outer auxiliary structure (83) to engage the

flange (70b).

13. A carrier device as claimed in claim 11, wherein the semi-spherical terminal block (70a) has a semi-spherical cup-shaped structure (70c) on an exterior surface thereof.

14. A carrier device as claimed in claim 13, wherein the cup-shaped structure (70c) is bent to form an annular flange (70d), and the coupled axial displacement limiting structure includes the annular flange (70d) and a shoulder (84) extending inwardly from the outer auxiliary structure (83) to engage the annular flange (70d).

15. A carrier device as claimed in claim 1, wherein:

the pre-stressed structure (3) and first force-receiving structure (1) are assembled to an auxiliary structure (81) having a flange (82) that extends under a base of the second force-receiving structure (2) and that includes the second contract structure (8), wherein the carrying end (4) is situated at a top end of the second force-receiving structure (2), the limiting structure (11) is at a top end of the auxiliary structure (81), and the limiting structure (11) is in contact with the second force-receiving structure (2), wherein the pre-stressed structure (3) resists displacement of the limiting structure (11), auxiliary structure (81), and second force-receiving structure (2) when the load or stress on the carrying end (4) is less than the preset value and permits the displacement of the limiting structure (11), auxiliary structure (81), and second force-receiving structure (2) when the load or stress on the carrying end (4) exceeds the preset value,

the pre-stressed structure (3) is a magnetic device (31) and the first contact structure (7) is provided on a semi-spherical terminal block (70a) movably positioned within an inner space of the auxiliary structure (81),

the magnetic device (31) includes first and second magnets respectively connected to the force limiting structure (11) and the semi-spherical terminal block (70a), and

movement of the semi-spherical terminal block (70a) within the inner space of the auxiliary structure (81) is limited by a coupled axial displacement limiting structure of the semi-spherical terminal block (70a) and the auxiliary structure (81).

16. A carrier device as claimed in claim 15, wherein the coupled axial displacement limiting structure includes a flange (70b) extending outwardly from a top of the semi-spherical terminal block (70a) and a shoulder (84) extending inwardly from the auxiliary structure (81) to engage the flange (70b).

17. A carrier device as claimed in claim 1, wherein:

the first contact structure (7) is a rolling wheel (72) installed on a first shaft (723) via a bearing (720), the first shaft (723) is installed on a wheel arm (722) pivotally mounted to the second force-receiving structure (2) by a second shaft (721), and

the pre-stressed structure (3) extends between or includes elements on the force limiting structure (11) and the wheel arm (722);

wherein the pre-stressed structure (3) is a magnetic device (31) that includes first and second magnets respectively connected to the force limiting

structure (11) and the wheel arm (722), said first and second magnets having same polarities to provide mutual magnetic repulsion.

18. A carrier device as claimed in claim 17, wherein:

the pre-stressed structure (3), the wheel arm (722), and the roller wheel (72) are assembled to an auxiliary structure (81) having a flange (82) that extends under a base of the second force-receiving structure (2) and that includes the second contract structure (8).

19. A carrier device as claimed in claim 18, wherein the pre-stressed structure (3) is a magnetic device (31) that includes first and second magnets respectively connected to the auxiliary structure (81) and the wheel arm (722), said first and second magnets having same polarities to provide mutual magnetic repulsion.

20. A carrier device as claimed in claim 18, wherein the pre-stressed structure (3) is a U-shaped leaf spring (35) installed between the auxiliary structure (81) and the wheel arm (722).

21. A carrier device as claimed in claim 1, wherein:

the first contact structure (7) is provided on a terminal block (71) movably positioned within an inner space of the second force-receiving structure (2), the pre-stressed structure (3) includes a permanent magnet (311) and a magnetically conductive member (312) connected to the second force-receiving structure (2),

the permanent magnet (311) is connected to the terminal block (71) via a guide rod (111) that extends through the magnetically conductive member (312), and

the first contact structure (7) having the first lower friction damping is a surface of the terminal block (71) having a low coefficient of sliding friction.

22. A carrier device as claimed in claim 1, wherein:

the first contact structure (7) is a rolling wheel (72) installed on a first shaft (723) via a bearing (720),

the first shaft (723) is installed on a wheel arm (722) pivotally mounted to the second force-receiving structure (2) by a second shaft (721), and

the pre-stressed structure (3) includes a magnetically conductive element (312) on one of the second force-receiving structure (2) and the wheel arm (722), and a permanent magnet (311) on the other of the second force-receiving structure (2) and the wheel arm (722).