Claims

1. A flaw detection machine with parallel lifting function, adapted for detecting flaw without demounting wheels, comprising

a trolley (1), slidable along two steel rails, between which it is provided,

a base frame (3), provided on said trolley (1),

a jacking apparatus for jacking wheels, with a felloe probe holder (6) provided thereon,

a tread flaw detecting device for detecting the flaw of the treads of the wheels,

a first jacking mechanism (9) for driving said jacking apparatus to move up and down,

a second jacking mechanism (5) for driving said tread flaw detecting device to move up and down,

wherein,

said tread flaw detecting device comprises

a vertical frame (2), mounted on said base frame (3) and able to slide up and down along an inner side wall of said base frame (3),

a tread probe manipulator (10), provided at an upper end of said vertical frame (2) and slidable along the length direction of said steel rail and

a tread probe frame (11), provided on said tread probe manipulator (10), and

said jacking apparatus is mounted on said vertical frame (2) and able to slide up and down along an inner side wall of said vertical frame.

2. The flaw detection machine of claim 1, wherein, the first jacking mechanism (9) and the second jacking mechanism (5) are supported by the trolley (1) and respectively drive the jacking apparatus and the vertical frame (2) to move up and down relative to the trolley (1) independently without interference with each other.

3. The flaw detection machine of claim 1 or 2, wherein,

said vertical frame (2) being mounted on said base frame and able to slide up and down along said inner side wall of said base frame (3) is realized, by providing a linear sliding pair between said vertical frame (2) and said base frame (3).

4. The flaw detection machine of claim 3, wherein,

said tread probe manipulator (10) being mounted on said vertical frame (2) and slidable along a direction parallel with that of said steel rail is realized, by providing a linear sliding pair between a top of said vertical frame (2) and a bottom of said tread probe manipulator (10).

5. The flaw detection machine of claim 4, wherein,

said jacking apparatus being sliably mounted on said vertical frame (2) is realized by providing a linear sliding pair between said inner side wall of said vertical frame (2) and an end of said jacking apparatus.

6. The flaw detection machine of any of claims 1-5, wherein,

said base frame (3) is a rectangular base formed by a bottom surface and four side walls;

a first guide rail or a guide channel extending along the up and down direction is formed

on the inner surface of two opposite side walls,

a lower end of said vertical frame (2) is a first rectangular frame formed by four side walls, which is adapted for being inserted into said first rectangular base, and

both ends of the first rectangular frame are formed with a first guide channel coordinating with said first guide rail, or a first guide rail coordinating with a first guide channel;

an upper end of said vertical frame (2) is formed by said first guide channels or first guide rails formed on both ends of the first rectangular frame, which extend upwardly;

a vertical guide rail (8) extending along the length direction of said steel rail is arranged on an upper end of said first guide channels or first guide rails on the both ends,

said tread probe manipulator (10) is slidably arranged on said vertical guide rail through a longitudinal guide channel on the bottom.

7. The flaw detection machine of claim 6, wherein,

said first guide channels or first guide rails are formed on two opposite side walls of said frame base (3), which are perpendicular with said steel rails,

two opposite side walls of said frame base (3), which are parallel with said steel rails, are respectively provided with a first mounting hole (31) for a tool to be inserted therein;

two opposite side walls of said vertical frame (2), which are parallel to said steel rails, are respectively provided with a second mounting hole (21) for a tool to be inserted therein.

8. The flaw detection machine of any of claims 1-7, wherein, said jacking apparatus comprises

a jacking frame (7), slidable along the inner side wall of said vertical frame (2),

a jacking structure for jacking wheels, provided on both sides of said jacking frame (7), and

a felloe probe holder (6) for detecting the flaw of the felloe, and

said jacking frame (7) is provided below the path of said tread probe manipulator (10) moving along the length direction of said steel rails.

9. The flaw detection machine of claim 8, wherein,

said jacking frame (7) is a second rectangular frame formed by four side walls,

second guide rails or second guide channels which extend along up and down direction are formed on an inner side of said vertical frame (2);

guide channels or guide rails, which coordinate with said second guide rails or guide channels are formed on an outer side of the end of said second rectangular frame.

10. The flaw detection machine of claim 9, wherein, said jacking structure comprises a slide bar (16), vertically fixed on said side wall of said jacking frame (7), which is parallel with said steel rails;

both ends of said slide bar (16) extend out of said side wall of said jacking frame (7);

a bracket (15) is sleeved on one end of said slide bar (16), which extends out of said side wall;

a roller (14) is provided on an upper end of said bracket (15);

a driving device is provided on at least one of two said rollers (14) provided on the same side as said jacking frame (7);

a bracket swing mechanism (18) is connected with the lower ends of both said brackets (15) provided on the same side as said jacking frame (7).

11. The flaw detection machine of claim 10, wherein,

said bracket swing mechanism (18) is an electric cylinder or an oil cylinder or an air cylinder, and both ends of said electric cylinder or oil cylinder or air cylinder are respectively fixed on the lower ends of two said brackets (15).

12. The flaw detection machine of claim 11, wherein,

said bracket (15) is V-shaped, and two said brackets (15) have openings on the same side as said jacking frame (7) are arranged oppositely.

13. The flaw detection machine of claim 12, wherein,

a hook device for hanging said jacking frame (7) on said steel rail is provided between the side walls of said bracket (15) and said jacking frame (7);

said hook device comprises

a hook beam (19), slidably sleeved on said slide bar (16),

a telescopic mechanism (17) for driving said hook beam (19) to stretch out and draw back along the vertical direction of said steel rail, provided at the inner side of said jacking frame (7);

a hook portion (190), provided at a free end of said hook beam (19) which extends towards one side of said steel rails and connects with said steel rails in a lapped manner.

14. The flaw detection machine of claim 13, further comprising a flaw detecting device for the felloe, which is provided between two said slide bars (16); said flaw detecting device comprises a felloe probe manipulator (4) fixed on the outer wall of said jacking frame (7), and

a felloe probe holder (6) for mounting the detection probe, provided at one end of said felloe probe manipulator (4).

15. The flaw detection machine of claim 14, wherein,

said first jacking mechanism (9), said second jacking mechanism (5) and said telescopic mechanism (17) are an electric cylinder, an oil cylinder or an air cylinder.

16. The flaw detection machine of claim 1 or 2, comprising

two said tread probe frames (11), respectively provided at both ends of said tread probe manipulator (10).