УДК 629.113

DISC BRAKE MECHANISM

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The utility model relates to mechanisms for converting kinetic energy into mechanical work of friction elements in the field of bicycle and motorcycle construction and can be used as a braking mechanism of the service brake system of a wheeled vehicle.

The typical disc brake mechanism includes a caliper, a hydraulic brake cylinder, brake pads, a brake disc, a brake adapter, a housing, guides and fasteners.

The most significant features of the disc brake mechanism are its complexity, high cost and the risk of loss of performance with frequent failure of the brake line. The possibility of damage of brake lines limits the amount of pressure in the brake system, which leads to the need for multi-piston disc brakes. The use of hydraulic disc brake results in increased cost of the vehicle and its complexity.

For the purpose of this study, a disc brake mechanism has been selected as a prototype. It includes a housing covering the brake disc and brake pads with friction pads installed in the housing on different sides of the brake disc. The prototype is characterized by high contact stresses and an increased contact area on the surface of the actuators and the difficulty of adjusting the gap between the brake pads and the brake disc.

The study is aimed at creating a disc brake that will reduce contact stresses on the surface of actuators and the contact area on the surface of the actuators.

To solve this problem, an innovative disc brake has been developed. It contains a brake disc, a housing with brake pads on both sides, each of which is connected with the brake cylinders in the housing, and a brake spring that works by twisting its end along its axis.

The brake adapter acts as a driving element, it bends around the body and is connected to the brake cylinders. The brake adapter can move along the guides on the brake cylinders. When the brake adapter rotates, the two brake cylinders attached to it rotate along multiple threads with the angle thread of 17 °– 23 °. When moving, the brake cylinders act on the brake pads and press the brake pads to the brake disc; the brake adapter moves along the guides on the brake cylinders when they move longitudinally. When the brake cylinders with the brake pads move axially, the brake pads are pressed against the brake disc, and its braking occurs.

Contact stresses on the working surfaces of the actuators in the proposed design of the disc brake mechanism are significantly reduced, since several inclined planes are simultaneously engaged in the transmission of pressure.

Due to the pressure generated by interaction of the brake cylinders in the brake housing, contact stresses on the inclined planes of the disc brake actuators and the friction area of the contact surfaces are reduced.