

<<1級/機械工学>>

問1

[0003] An endless conveyer belt linked in chainlike fashion is used to convey metal products or the like being treated at high temperatures in a hot furnace. The conveyer belt is formed of many chains or spirals, linked by chain rods formed of heat-resistant steel wire material. However, the flexural strength of this material under an atmosphere of 1,000 - 1,200°C is a mere 3 kg per square mm maximum, so the rods may become deformed in a short time. This can cause unevenness in the shearing force acting on the linkages of the rods with the chains or spirals, with great shearing force being locally concentrated, which can result in the chains or spirals breaking, the belt snaking, and ultimately rendering the conveyer useless.

[0004] While there is known a conveyer belt using carbon fiber-reinforced carbon of which the strength at up to 2,500°C tends to exceed that at room temperature, usage in an acidic atmosphere which would react with carbon is disadvantageous.

[0005] Circulating the conveyer belt through the furnace subjects the rods, assembled in the transverse direction as to the travel direction of the belt, to particularly high tensile force, i.e. shearing force approximately perpendicular to the rods, so shearing strength of the rods approximately perpendicular to the longitudinal direction thereof must be particularly ensured.

問2

[0039] While the rotary valve according to the present invention will be described below by way of an example in which the same is disposed in a lead air flow path of a stratified scavenging two-cycle engine, this rotary valve is not restricted to this application, and may be used as a fluid control valve disposed between fluid flow paths. Moreover, fluid which this rotary valve can control is not restricted to air; rather, flow rate and the like of various fluids such as liquids and gasses can be controlled. Accordingly, the present invention is not restricted to the embodiment described hereinafter, and various modifications can be made.

[0040] With a stratified scavenging two-cycle engine 2, a piston 3 is slidably fit within a cylinder 2 mounted on a crankcase 6. A crankshaft 8 rotatably attached to the crankcase 6 is linked to one end of a crank 9 rotatably borne within a crank chamber 7, and is also linked to the piston 3 by a connecting rod 4. Upon an air-fuel mixture compressed in a cylinder chamber C being ignited at top dead center of the piston 3 by a spark plug 5 attached above the cylinder 2, the air-fuel mixture explodes, pushing the piston 3 downwards.

問 3

1. An even balance comprising:

a pan for receiving an object to be measured;

a pan for receiving a measurement weight;

a base including front and rear support plates opposed to and spaced from each other, the front and rear support plates including V-shaped fulcrum receivers at top ends thereof and inverted-V-shaped fulcrum receivers positioned directly below the V-shaped fulcrum receivers at an intermediate position in a height direction thereof;

an upper rocking arm including a pair of front and rear rocking fulcrum projections supported by the V-shaped fulcrum receivers at an intermediate position in a longitudinal direction thereof and hook portions having V-shaped grooves at both ends in the longitudinal direction thereof;

a lower rocking arm including a pair of front and rear rocking fulcrum projections supported by the inverted-V-shaped fulcrum receivers at an intermediate position in a longitudinal direction thereof and hook portions having inverted-V-shaped grooves at both ends in the longitudinal direction thereof; and

a pair of left and right vertical raising-and-lowering shafts having respective pairs of upper and lower window holes, through which the hook portions at both ends of the upper and lower rocking arms are loosely inserted, at the bottom ends, top edges of the upper window holes and bottom edges of the lower window holes being shaped so as to engage with the V-shaped grooves and the inverted-V-shaped grooves, respectively, while the upper and lower rocking arms are parallel to each other.