

問 1

[0002]

In a bicycle parking lot, a bicycle parking device for locking bicycles is installed. In an example of conventional technology, the bicycle parking device locks the bicycle by means of open/close arms which are engaged slightly above the ground-contacting position of the wheel. The lock arms closed by a spring member are pushed open by the front wheel. As the front wheel abuts on a contact plate, a switch is activated to return the lock arms to closed state by the spring member, where the lock arms embracing the front wheel are locked. In another example of conventional technology, when the front wheel is positioned in park position, the front wheel presses down on the contact plate. As a result, the open/close arms linked with the contact plate are closed, embracing the front wheel.

[0003]

Because the bicycle wheels have varying sizes and thicknesses, and are the property of others, the open/close arms are attached with a generous amount of clearance or play with respect to the bicycle parking device, just in case. Accordingly, if the front wheel is tilted or not positioned at the correct location, the open/close arms may fail to be locked.

問 2

As described above, the fluid injection valve comprises the valve seat 10 with the valve seat face 10a disposed along the fluid passageway; the valve body 8 controlling the opening and closing of the fluid passageway by being separated from or seated on the valve seat face 10a; and the spray hole plate 11 having a plurality of spray holes 12, wherein the flows in the spray holes and the flows immediately under the spray holes are substantially liquid film flows. According to the spray generation method, the directions of the jets 30, 31 from the spray holes 12, 12 are not necessarily aligned with the directions of the central axes of the spray holes 12, nor are the jets 30, 31 necessarily caused to intersect each other downstream thereof. After the jets from the spray holes 12 have become sprays at a downstream position thereof, the sprays are caused to become closer or converge by the Coanda effect acting between the sprays. After the sprays have converged such that they can be considered a substantially single solid cone, an entrainment of ambient air of the spray based mostly on the momentum theory is caused, inducing a resultant airflow along a downstream flow direction of a

predetermined portion of the spray. Until the behaviors are substantially eliminated, the peak at substantially the center of the injection amount distribution and the spray angle reduction are continued. In this way, both atomization of fuel spray and an increase in the freedom of design of spray shape, spray pattern, and/or injection amount distribution can be achieved. It should be obvious that the peak of the injection amount distribution may not necessarily be located at substantially the center of the lateral cross section of a spray, and that the spray angle may not necessarily be minimized. It should also be obvious that the spray hole plate 11 may be a nozzle portion integrally formed with the valve seat 10, and the same effect can be provided.

問 3

1. A refill (2) for a ballpoint pen (1), the refill (2) comprising:

a first annular component (3) having an outer peripheral surface (5) on a rear end (50) side;

a second annular component (4) made of elastic material and having an inner peripheral surface (6), the inner peripheral surface (6) being fitted on the outer peripheral surface (5); and

an ink (7) accommodated in a space defined by the first annular component (3) and the inner peripheral surface (6),

wherein

the outer peripheral surface (5) includes a first inclined portion (51) with an outer diameter which becomes greater with increasing distance from the rear end side, a first annular portion (52) continuous with the first inclined portion, a second inclined portion (53) continuous with the first annular portion (52) and having an outer diameter which becomes smaller with increasing distance from the rear end side, an annular recess (54) continuous with the second inclined portion (53), a third inclined portion (55) continuous with the annular recess (54) and having an outer diameter which becomes greater with increasing distance from the rear end side, and a second annular portion (56) continuous with the third inclined portion (55) and having a constant outer diameter,

the inner peripheral surface (6), before being fitted, has an inner diameter which is greater than the annular recess (54) and smaller than the outer diameter of the second annular portion (56), and

the first annular portion (52) has an outer diameter greater than the outer diameter of the second annular portion (56).