

★★★ <第24回知的財産翻訳検定試験【第13回和文英訳】> ★★★

≪ 1 級課題-機械工学-≫

【問 1】

[0002] Parking devices that lock bicycles are installed in bicycle parking lots. One example of conventional technology is a parking device that locks a bicycle by opening/closing arms engaging somewhat above a position where a wheel is in contact with the ground. When locking the bicycle, the locking arms that are in a closed state by a spring member are pushed open by the front wheel, and then are returned to the closed state by the spring member upon the front wheel striking an abutting plate that activates a switch. Another example of conventional technology is a parking device having a portion that is depressed by the front wheel when the front wheel is at a parking position, and opening/closing arms linked thereto close to cradle the front wheel.

[0003] However, the opening/closing arms are attached to the parking device with a considerable amount of looseness or play, as a precaution, so as to be able to handle a range of wheel sizes and thicknesses of bicycles without damaging someone's bicycle. Accordingly, the bicycle may not be able to be locked if the front wheel is tilted or not at the correct position.

【問 2】

As described above, there is provided a spray generating method by a fluid injection valve. The fluid injection valve includes the valve seat 10 that has the valve seat face 10a partway along the fluid channel, the valve body 8 that controls opening/closing of the fluid channel by separation from and contact with the valve seat face 10a, and the nozzle hole plate 11 that has a plurality of nozzle holes 12 and is situated downstream from the valve seat 10. Flows in the nozzle holes and flows directly below the nozzle holes of the fluid injection valve form a general liquid film flow. The directions of the jet flows 30 and 31 from the nozzle holes 12 neither are necessarily aligned with the center axial direction of the nozzle holes 12, nor necessarily intersect each other downstream. After becoming sprays at a downstream position, the jet flows from the nozzle holes 12 are brought into proximity or converged by the Coanda effect that acts among the plurality of sprays. Once the sprays are identifiable as having substantially become a solid cone, entrainment of ambient air primarily based on momentum theory, and resultant induction of airflow following the downstream flow at a predetermined portion

within the sprays, are generated. Peaking of the injection quantity distribution at the generally center portion thereof and reduction in the spray angle are continued until these behaviors substantially disappear. Thus, both atomization of fuel sprays, and improved freedom of design regarding spray form, spray pattern, and injection quantity distribution, can be achieved. It should be clearly understood that the peak of the injection quantity distribution does not necessarily have to be the general center portion of the spray cross-section, and that the spray angle does not necessarily have to be minimal. It should further be clearly understood that the same advantages can be obtained by a nozzle part where the nozzle hole plate 11 and the valve seat 10 are integrally configured.

【問 3】

1. A refill (2) for a ballpoint pen (1), comprising:
  - a first annular component (3) having a rearward end (50) and an outer peripheral surface (5) on the rearward end (50);
  - a second annular component (4) made of an elastic material, the second annular component (4) having an inner circumferential surface (6), the inner circumferential surface (6) fitting onto the outer peripheral surface (5); and
  - an ink (7) housed in a space partitioned by the first annular component (3) and the inner circumferential surface (6), wherein
    - the outer peripheral surface (5) includes: a first inclined portion (51) that increases in outer diameter with increasing separation from the rearward end; a first annular portion (52) continuous with the first inclined portion (51); a second inclined portion (53) continuous with the first annular portion (52), the second inclined portion (53) decreasing in outer diameter with increasing separation from the rearward end; an annular recessed portion (54) continuous with the second inclined portion (53); a third inclined portion (55) continuous with the annular recessed portion (54), the third inclined portion (55) increasing in outer diameter with increasing separation from the rearward end; and a second annular portion (56) continuous with the third inclined portion (55), the second annular portion (56) having a constant outer diameter,
    - the inner circumferential surface (6) has an inner diameter smaller than the outer diameter of the second annular portion (56) and larger than an outer diameter of the annular recessed portion (54) before the fitting; and
    - the first annular portion (52) has an outer diameter larger than the outer diameter of the second annular portion (56).