Claims

1. A thermochromic writing instrument containing a thermochromic ink, comprising:

a barrel;

a writing body accommodated in the barrel so as to be capably of moving in a longitudinal direction; and

an operation portion provided on an outer surface of the barrel,

wherein a pen tip of the writing body is adapted to be project/retract from/into a front-end hole of the barrel by operating the operation portion,

the thermochromic ink is contained inside the writing body,

a pen tip capable of ejecting the thermochromic ink is provided at a front end of the writing body, and

a friction portion capable of thermally changing color of the handwriting of the thermochromic ink by the frictional heat generated when the handwriting is rubbed with the friction portion is provided on the outer surface of the barrel.

2. The thermochromic writing instrument according to claim 1, wherein the friction portion is provided at a rear end of the barrel.

3. The thermochromic writing instrument according to claim 2, wherein

the operation portion is provided at the rear end of the barrel,

the thermochromic writing instrument further comprises a projection/retraction mechanism which shifts the pen tip from the pen-tip-retracted state to the pen-tip-projected state by a forward press operation of the operation portion toward the front end of the barrel,

the friction portion is provided at an outer surface of the rear end of the operation portion and

a holding portion capable of being held when rubbing with the friction portion is provided on the outer peripheral surface of the operation portion.

4. The thermochromic writing instrument according to claim 2, wherein

the operation portion is provided at the rear end of the barrel,

the thermochromic writing instrument further comprises a projection/retraction mechanism which shifts the pen tip from the pen-tip-retracted state to the pen-tip-projected state by a rotation operation of the operation portion against the front part of the barrel,

the friction portion is provided at the outer surface of the rear end of the operation portion and

a holding portion capable of being held when rubbing with the friction portion is provided on the outer peripheral surface of the operation portion.

5. The thermochromic writing instrument according to claim 2, wherein

the operation portion is projected radially outward from a side wall of the barrel and

the thermochromic writing instrument further comprises a projection/retraction mechanism which shifts the pen tip from the pen-tip-retracted state to the pen-tip-projected state by a forward press operation of the operation portion.

6. The thermochromic writing instrument according to claim 2, wherein the operation portion is radially outwardly projected from the side wall of the barrel and

the thermochromic writing instrument further comprises a projection/retraction mechanism which shifts the pen tip from the pen-tip-retracted state to the pen-tip-projected state by a radially inward press operation of the operation portion.

7. The thermochromic writing instrument according to claim 2, wherein a friction-portion-operation portion is provided on the outer surface of the barrel and

the friction portion is adapted to be projectable/retractable from/into the rear end of the barrel by operating the friction-portion-operation portion.

Claims

1. A thermochromic writing instrument containing a thermochromic ink, comprising:

a writing body configured to contain the thermochromic ink;

a barrel configured to accommodate the writing body so as to be movable in a longitudinal direction;

an operation portion configured to project/retract a pen tip of the writing body from/into a front-end hole of the barrel;

a friction portion including an elastic material having low abrasion property, and being configured to thermally change color of the handwriting of the thermochromic ink by the frictional heat generated when the handwriting is rubbed with the friction portion, wherein

the friction portion is provided at a rear end of the barrel, and the operation portion is provided at a portion other than the rear end of the barrel.

2. A thermochromic writing instrument containing a thermochromic ink, comprising:

a writing body configured to contain the thermochromic ink;

a barrel configured to accommodate the writing body so as to be movable in a longitudinal direction;

an operation portion configured to project/retract a pen tip of the writing body from/into a front-end hole of the barrel;

a friction portion including an elastic material having low abrasion property,

and being configured to thermally change color of the handwriting of the thermochromic ink by the frictional heat generated when the handwriting is rubbed with the friction portion, wherein

the friction portion is provided at a front end of the barrel, and the operation portion is provided at a portion other than the front end of the barrel.

3. A thermochromic writing instrument containing a thermochromic ink, comprising:

a writing body configured to contain the thermochromic ink;

a barrel configured to accommodate the writing body so as to be movable in a longitudinal direction;

an operation portion configured to project/retract a pen tip of the writing body from/into a front-end hole of the barrel;

a friction portion including an elastic material having low abrasion property, and being configured to thermally change color of the handwriting of the thermochromic ink by the frictional heat generated when the handwriting is rubbed with the friction portion, wherein

the friction portion is provided at an outer surface of a clip projected from an outer surface of the barrel, and the operation portion is provided at a portion other than the clip.

4. The thermochromic writing instrument according to claim 1, wherein:

a friction-portion-operation portion is provided on the barrel; and

the friction portion is adapted to be projectable/retractable from/into the rear end of the barrel by operating the friction-portion-operation portion.

5. The thermochromic writing instrument according to any one of claims 1 to 4, wherein:

the operation portion is projected radially outward from a side wall of the barrel; and

the thermochromic writing instrument further comprises a projection/retraction mechanism which shifts the pen tip from the pen-tip-retracted state to the pen-tip-projected state by a forward press operation of the operation portion.

6. The thermochromic writing instrument according to any one of claims 1 to 4, wherein:

the operation portion is radially outwardly projected from a side wall of the barrel; and

the thermochromic writing instrument further comprises a projection/retraction mechanism which shifts the pen tip from the pen-tip-retracted state to the pen-tip-projected state by a radially inward press operation of the operation portion.

7. The thermochromic writing instrument according to claim 2 or 3, wherein:

the operation portion is provided at a rear end of the barrel; and

the thermochromic writing instrument further comprises a projection/retraction mechanism which shifts the pen tip from the pen-tip-retracted state to the pen-tip-projected state by a forward press operation of the operation portion.

8. The thermochromic writing instrument according to any one of claims

1 to 4, wherein:

the operation portion is a rear part of the barrel; and

the thermochromic writing instrument further comprises a projection/retraction mechanism projecting and retracting the pen tip by a rotation operation of the operation portion against the front part of the barrel.

9. The thermochromic writing instrument according to any one of claims 1 to 4, wherein:

the operation portion is a rear part of the barrel; and

the thermochromic writing instrument further comprises a projection/retraction mechanism projecting and retracting the pen tip by a forward press operation of the operation portion toward a front part of the barrel.

10. The thermochromic writing instrument according to claim 5, wherein:

a plurality of the writing bodies are accommodated in the barrel movably in a longitudinal direction; and

each of the pen tips of the plurality of the writing bodies is adapted to be alternatively projectable/retractable from/into the front-end hole of the barrel.

11. The thermochromic writing instrument according to any one of claims 1 to 10, wherein:

the pen tip of the writing body is a ball-point pen tip; and

as a mechanism for preventing the pen tip from drying, a pen tip ball is urged forward to press the pen tip ball to an inner surface of an inward caulked front end rim portion of the ball-point pen tip.

12. The thermochromic writing instrument according to any one of claims 1 to 10, wherein:

the pen tip of the writing body is other than the ball-point pen tip; and

as a mechanism for preventing the pen tip from drying, the front-end hole of the barrel is closed to tightly seal the pen tip retracted within the barrel.