CLAIMS

1. A thermochromic writing instrument, comprising: a writing body, storing a thermochromic ink therein, stored in a barrel; an operation body provided in the barrel to be operated to longitudinally move the writing body; a nib of the writing body configured to be capable of appearing from a front end of the writing instrument, wherein

the writing instrument further includes a friction unit, rubbing handwriting in the thermochromic ink and capable of thermally changing the color of the handwriting by frictional heat generated at that time, and at least one clip body as the operation body, the friction unit is provided at a rear end of the barrel, and the clip body is provided in an area other than the rear end of the barrel.

2. The thermochromic writing instrument of claim 1, wherein the writing instrument includes only a single of the clip body as the operation body, and by operating the single clip body, the nib of the writing body is enabled to be put in a projection condition and a retraction condition.

3. The thermochromic writing instrument of claim 1 or 2, wherein the writing instrument further includes a longitudinally extending slide hole is provided in a side wall of the barrel and an appearance mechanism putting the nib of the writing body from a retraction condition into a projection condition by slide operating the clip body placed in the slide hole forward.

4. The thermochromic writing instrument of claim 3, wherein the barrel includes two or more components capable of being coupled to each other, a first or second longitudinally extending long hole having an open front or rear end is provided respectively on respective side walls of two of the components configuring the barrel, and when coupling the two components, the first and second long holes form the slide hole in communication with each other.

5. The thermochromic writing instrument of claim 4, wherein each side wall of the two components configuring the barrel is coupled to overlap radially with each other, and the first and second long holes form the slide hole in communication with each other in a condition radially overlapping with each other.

6. The thermochromic writing instrument of claim 4 or 5, wherein the clip body is assembled with the slide hole through the steps of:

inserting a base portion of the clip body into the first long hole provided in one of the components configuring the barrel; and

forming the slide hole by, while inserting the base portion of the clip body into

the second long hole provided in another of the components configuring the barrel, coupling the other component to the one component to communicate the second long hole with the first long hole.

7. The thermochromic writing instrument of any one of claims 3 through 6, wherein the writing instrument includes a cam mechanism in the barrel as the appearance mechanism, the cam mechanism includes a cam and a projection capable of alternately engaging with each other at longitudinally different positions, and by slide operating the clip body forward, the cam and the projection are alternately engaged with each other at longitudinally different positions to alternately put the nib of the writing body in the projection condition or the retraction condition.

8. The thermochromic writing instrument of claim 7, wherein the barrel includes therein, as the appearance mechanism, a plurality of longitudinally extending cam teeth and cam grooves alternately placed along a circumferential direction, a rotary member having a plurality of projected ribs rotatably placed in a rear of the writing body and capable of alternately engaging with the cam teeth or the cam grooves, another plurality of cam teeth provided in the clip body and turning the rotary member, and an biasing member biasing the writing body backward, and

by slide operating the clip body forward against a biasing force of the biasing member, the projected ribs are alternately engaged with the cam teeth or the cam grooves to alternately put the nib of the writing body in the projection condition or the retraction condition.

9. The thermochromic writing instrument of claim 8, wherein the clip body is stored in the barrel and having a longitudinally extending stem, and the stem and the rotary member are locked to each other in a condition having longitudinal allowance.

10. The thermochromic writing instrument of any one of claims 3 through 9, wherein a longitudinally extending guide groove is formed on the outer surface of the barrel forward of the slide hole, a projected bump is provided on a front inner surface of the clip body, and the bump longitudinally slides in the guide groove in association with a longitudinal movement of the clip body.

11. The thermochromic writing instrument of any one of claims 1 through 10, wherein the friction unit is made with an elastic material, and a portion of the friction unit abuts on the clip body in a nib retraction condition.

12. The thermochromic writing instrument of any one of claims 1 through 11, wherein the friction unit is made with an elastic material and is fastened to the rear end of the barrel or a rear end of a rear barrel by press fitting, engaging, screwing, fitting, adhesion, and two color molding, or an entire of the barrel or an entire of a rear barrel

is formed with the elastic material as the friction unit.

13. A thermochromic writing instrument, comprising: a thermochromic ink stored inside a writing body; a nib capable of ejecting the thermochromic ink provided at a front end of the writing body; a barrel storing the writing body longitudinally movably in a backwardly biased condition therein; and a front end hole of the barrel configured to allow the nib of the writing body to appear therefrom, wherein

a longitudinally extending slide hole is provided in a side wall of the barrel, a clip body is projected radially outward from the slide hole, the clip body is configured to become longitudinally movable along the slide hole, the writing instrument further includes an appearance mechanism putting the nib in a projection condition from the front end hole of the barrel by slide operating the clip body forward from a nib retraction condition, and putting the nib in the retraction condition by operating the clip body from the nib projection condition, and a friction unit rubbing handwriting in the thermochromic ink and capable of thermally changing the color of the handwriting by frictional heat generated at that time is provided at a rear end of the barrel.

14. The thermochromic writing instrument of claim 13, wherein the appearance mechanism is a side sliding appearance mechanism using a rotary cam mechanism, includes at least a cam formed on an inner surface of the barrel, a rotary member engaged with the cam and abutting on a rear end of the writing body, the clip body provided with cam teeth engaged with the rotary member, and an biasing member stored in the barrel and biasing the writing body backward, and is a type of slide operating the clip body forward for both a nib projection operation and a nib retraction operation.

15. The thermochromic writing instrument of claim 13 or 14, wherein the barrel includes a front barrel, an intermediate barrel coupled to a rear end of the front barrel, and a rear barrel coupled to a rear end of the intermediate barrel, a front end hole allowing the nib to appear is provided at a front end of the front barrel, a cam is provided on an inner surface of the intermediate barrel, a first long hole opened backward and longitudinally extending is provided at the rear end of the intermediate barrel, a second long hole opened forward and longitudinally extending is provided with at a front end of the rear barrel, the rear end of the intermediate barrel and the front end of the rear barrel are coupled to communicate the first long hole with the second long hole, the slide hole is formed in the side wall of the barrel by the first long hole and the second long hole, and the friction unit is provided at a rear end of the rear barrel.

16. The thermochromic writing instrument of claim 15, wherein a side wall of the intermediate barrel and a side wall of the rear barrel are coupled to radially overlap with

each other, and the first long hole and the second long hole are radially communicated with each other.

17. The thermochromic writing instrument of any one of claims 13 through 16, wherein the clip body has a longitudinally extending stem stored in the barrel, and the stem and the rotary member are longitudinally locked in a condition being rotatable to each other and having longitudinal allowance to each other.

18. The thermochromic writing instrument of any one of claims 13 through 17, wherein a longitudinally extending guide groove is formed on an outer surface of the barrel forward of the slide hole, a projected bump is provided on a front inner surface of the clip body, and the bump longitudinally slides in the guide groove in association with a longitudinal movement of the clip body.

19. The thermochromic writing instrument of any one of claims 13 through 18, wherein the friction unit is made with an elastic material, and a portion of the friction unit abuts on the clip body in the nib retraction condition.

20. A writing instrument, comprising: a writing body stored in a barrel; an operation body provided in the barrel to be operated to longitudinally move the writing body; and a nib of the writing body configured to be capable of appearing from a front end of a writing instrument, wherein

the writing instrument further includes at least one clip body as the operation body, a longitudinally extending slide hole provided in a side wall of the barrel, and an appearance mechanism putting the nib of the writing body from a retraction condition into a projection condition by slide operating the clip body placed in the slide hole forward, and

the barrel includes a plurality of components capable of being coupled to each other, a first or second long hole longitudinally extending and opened forward or backward is provided respectively on respective side walls of two of the components configuring the barrel, and when coupling the two components, the first and second long holes form the slide hole in communication with each other.

21. The writing instrument of claim 20, wherein each side wall of the two components configuring the barrel is coupled to overlap radially with each other, and the first and second long holes form the slide hole in communication with each other in a condition radially overlapping with each other.

22. The writing instrument of claim 20 or 21, wherein a portion including a rear end of the barrel includes a rear barrel as the components, and when coupling the rear barrel to another of the components coupled to the rear barrel, the first and second long holes form the slide hole in communication with each other.

23. A writing instrument, comprising: a writing body stored in a barrel; an operation body provided in the barrel to be operated to longitudinally move the writing body; and a nib of the writing body configured to be capable of appearing from a front end of a writing instrument, wherein

the writing instrument further includes a longitudinally extending slide hole provided in a side wall of the barrel and an appearance mechanism putting the nib of the writing body from a retraction condition into a projection condition by slide operating the operation body placed in the slide hole forward,

the barrel includes therein, as the appearance mechanism, a plurality of longitudinally extending cam teeth and cam grooves alternately placed along a circumferential direction, a rotary member having a plurality of projected ribs rotatably placed in a rear of the writing body and capable of alternately engaging with the cam teeth or the cam grooves, another plurality of cam teeth provided in the operation body and turning the rotary member, and an biasing member biasing the writing body backward,

the operation body is provided with a longitudinally extending stem stored in the barrel, and the stem and the rotary member are locked to each other in a condition having longitudinal allowance, and

by slide operating the operation body forward against a biasing force of the biasing member, the projected ribs are alternately engaged with the cam teeth or the cam grooves at longitudinally different positions to alternately put the nib of the writing body in the projection condition or the retraction condition.

24. The writing instrument of claim 23, wherein the barrel includes a plurality of components capable of being coupled to each other, a first or second long hole longitudinally extending and opened forward or backward is provided respectively on respective side walls of two of the components configuring the barrel, and when coupling the two components, the first and second long holes form the slide hole in communication with each other.

25. The writing instrument of claim 24, wherein each side wall of the two components configuring the barrel is coupled to overlap radially with each other, and the first and second long holes form the slide hole in communication with each other in a condition radially overlapping with each other.

26. The writing instrument of any one of claims 23 through 25, wherein the operation body is a clip body.

CLAIMS

1. A thermochromic writing instrument, comprising:
a writing body, storing a thermochromic ink therein, stored in a barrel; an operation body provided at the barrel to be operated to longitudinally move the writing body; and a nib of the writing body configured to be capable of appearing from a front end of the writing instrument, wherein

the thermochromic writing instrument further includes a friction unit, for rubbing handwriting in the thermochromic ink and capable of thermally changing the color of the handwriting by frictional heat generated at that time, and at least one clip body as the operation body, the friction unit is provided at a rear end of the barrel, and the clip body is provided in an area other than the rear end of the barrel, and wherein the thermochromic writing instrument includes a longitudinally extending slide hole provided in a side wall of the barrel and an appearance mechanism putting the nib of the writing body from a retraction condition into a projection condition by slide operating the clip body placed in the slide hole forward, and wherein

the barrel includes two or more components capable of being coupled to each other, a first or second longitudinally extending long hole having an open front or rear end is provided respectively on respective side walls of two of the components configuring the barrel, and when coupling the two components, the first and second long holes form the slide hole in communication with each other.

2. The thermochromic writing instrument of claim 1, wherein the thermochromic writing instrument includes only a single clip body as the operation body, and by operating the single clip body, the nib of the writing body is enabled to be put in a projection condition and a retraction condition.

3. The thermochromic writing instrument of claim 1, wherein each side wall of the two components configuring the barrel is coupled to overlap radially with each other, and the first and second long holes form the slide hole in communication with each other in a condition radially overlapping with each other.

4. The thermochromic writing instrument of any one of claims 1 through 3, wherein the clip body is assembled with the slide hole through the steps of:

inserting a base portion of the clip body into the first long hole provided in one of the components configuring the barrel; and

forming the slide hole by, while inserting the base portion of the clip body into the second long hole provided in another of the components configuring the barrel, coupling the other component to the one component to communicate the second long hole with the first long hole.

5. The thermochromic writing instrument of any one of claims 1 through 4, wherein the writing instrument includes a cam mechanism in the barrel as the appearance mechanism, the cam mechanism includes a cam and a projection capable of alternately engaging with each other at longitudinally different positions, and by slide operating the clip body forward, the cam and the projection are alternately engaged with each other at longitudinally different positions to alternately put the nib of the writing body in the projection condition or the retraction condition.

6. The thermochromic writing instrument of claim 5, wherein the barrel includes therein, as the appearance mechanism, a plurality of longitudinally extending first cam teeth and cam

grooves alternately placed along a circumferential direction, a rotary member having a plurality of projected ribs rotatably placed in the rear of the writing body and capable of alternately engaging with the first cam teeth or the cam grooves, a plurality of second cam teeth provided in the clip body and turning the rotary member, and an biasing member biasing the writing body backward, and

by slide operating the clip body forward against a biasing force of the biasing member, the projected ribs are alternately engaged with the first cam teeth or the cam grooves to alternately put the nib of the writing body in the projection condition or the retraction condition.

7. The thermochromic writing instrument of claim 6, wherein the clip body is stored in the barrel and having a longitudinally extending stem, and the stem and the rotary member are locked to each other in a condition having longitudinal allowance.

8. The thermochromic writing instrument of any one of claims 1 through 7, wherein a longitudinally extending guide groove is formed on the outer surface of the barrel forward of the slide hole, a projected bump is provided on a front inner surface of the clip body, and the bump longitudinally slides in the guide groove in association with a longitudinal movement of the clip body.

9. The thermochromic writing instrument of any one of claims 1 through 8, wherein the friction unit is made with an elastic material, and a portion of the friction unit abuts on the clip body in a nib retraction condition.

10. The thermochromic writing instrument of any one of claims 1 through 9, wherein the friction unit is made with an elastic material and is fastened to the rear end of the barrel or a rear end of a rear barrel by press fitting, engaging, screwing, fitting, adhesion, and two color molding, or an entire of the barrel or an entire of a rear barrel is formed with the elastic material as the friction unit.

11. A thermochromic writing instrument, comprising:

a thermochromic ink stored inside a writing body;

a nib capable of ejecting the thermochromic ink provided at a front end of the writing body;

a barrel storing the writing body longitudinally movably in a backwardly biased condition therein;

and a front end hole of the barrel configured to allow the nib of the writing body to appear therefrom, wherein

a longitudinally extending slide hole is provided in a side wall of the barrel, a clip body is projected radially outward from the slide hole, the clip body is configured to become longitudinally movable along the slide hole, the writing instrument further includes an appearance mechanism putting the nib in a projection condition from the front end hole of the barrel by slide operating the clip body forward from a nib retraction condition, and putting the nib in the retraction condition by operating the clip body forward from the nib projection condition, and a friction unit for rubbing handwriting in the thermochromic ink and capable of thermally changing the color of the handwriting by frictional heat generated at that time is provided at a rear end of the barrel, wherein

the barrel includes a front barrel, an intermediate barrel coupled to a rear end of the front barrel, and a rear barrel coupled to a rear end of the intermediate barrel, the front end hole allowing the nib to appear is provided at a front end of the front barrel, a cam is provided on an inner surface of the intermediate barrel, a first long hole opened backward and longitudinally extending is provided at the rear end of the intermediate barrel, a second long hole opened forward and longitudinally extending is provided with at a front end of the

rear barrel, the rear end of the intermediate barrel and the front end of the rear barrel are coupled to communicate the first long hole with the second long hole, the slide hole is formed in the side wall of the barrel by the first long hole and the second long hole, and the friction unit is provided at a rear end of the rear barrel.

12. The thermochromic writing instrument of claim 11, wherein the appearance mechanism is a side sliding appearance mechanism using a rotary cam mechanism, includes at least a cam formed on an inner surface of the barrel, a rotary member engaged with the cam and abutting on a rear end of the writing body, the clip body provided with cam teeth engaged with the rotary member, and an biasing member stored in the barrel and biasing the writing body backward, and is a type of slide operating the clip body forward for both a nib projection operation and a nib retraction operation.

13. The thermochromic writing instrument of claim 11, wherein a side wall of the intermediate barrel and a side wall of the rear barrel are coupled to radially overlap with each other, and the first long hole and the second long hole are radially communicated with each other.

14. The thermochromic writing instrument of any one of claims 11 through 13, wherein the clip body has a longitudinally extending stem stored in the barrel, and the stem and the rotary member are longitudinally locked in a condition being rotatable to each other and having longitudinal allowance to each other.

15. The thermochromic writing instrument of any one of claims 11 through 14, wherein a longitudinally extending guide groove is formed on an outer surface of the barrel forward of the slide hole, a projected bump is provided on a front inner surface of the clip body, and the bump longitudinally slides in the guide groove in association with a longitudinal movement of the clip body.

16. The thermochromic writing instrument of any one of claims 11 through 15, wherein the friction unit is made with an elastic material, and a portion of the friction unit abuts on the clip body in the nib retraction condition.

17. A writing instrument, comprising: a writing body stored in a barrel; an operation body provided at the barrel to be operated to longitudinally move the writing body; and a nib of the writing body configured to be capable of appearing from a front end of a writing instrument, wherein

the writing instrument further includes at least one clip body as the operation body, a longitudinally extending slide hole provided in a side wall of the barrel, and an appearance mechanism putting the nib of the writing body from a retraction condition into a projection condition by slide operating the clip body placed in the slide hole forward, and

the barrel includes a plurality of components capable of being coupled to each other, a first or second long hole longitudinally extending and opened forward or backward is provided respectively on respective side walls of two of the components configuring the barrel, and when coupling the two components, the first and second long holes form the slide hole in communication with each other.

18. The writing instrument of claim 17, wherein each side wall of the two components configuring the barrel is coupled to overlap radially with each other, and the first and second long holes form the slide hole in communication with each other in a condition radially overlapping with each other.

19. The writing instrument of claim 17 or 18, wherein a portion including a rear end of the

barrel includes a rear barrel as one of the components, and when coupling the rear barrel to another of the components coupled to the rear barrel, the first and second long holes form the slide hole in communication with each other.

20. A writing instrument, comprising:
a writing body stored in a barrel;
an operation body provided at the barrel to be operated to longitudinally move the writing body;
and a nib of the writing body configured to be capable of appearing from a front end of a writing instrument, wherein
the writing instrument further includes a longitudinally extending slide hole provided in a side wall of the barrel and an appearance mechanism putting the nib of the writing body from a retraction condition into a projection condition by slide operating the operation body placed in the slide hole forward,
the barrel includes a plurality of components capable of being coupled to each other, a first or second long hole longitudinally extending and opened forward or backward is provided respectively on respective side walls of two of the components configuring the barrel, and when coupling the two components, the first and second long holes form the slide hole in communication with each other,
the barrel includes therein, as the appearance mechanism, a plurality of longitudinally extending first cam teeth and cam grooves alternately placed along a circumferential direction, a rotary member having a plurality of projected ribs rotatably placed in the rear of the writing body and capable of alternately engaging with the first cam teeth or the cam grooves, a plurality of second cam teeth provided in the operation body and turning the rotary member, and an biasing member biasing the writing body backward,
the operation body is provided with a longitudinally extending stem stored in the barrel, and the stem and the rotary member are locked to each other in a condition having longitudinal allowance, and
by slide operating the operation body forward against a biasing force of the biasing member, the projected ribs are alternately engaged with the first cam teeth or the cam grooves at longitudinally different positions to alternately put the nib of the writing body in the projection condition or the retraction condition.

21. The writing instrument of claim 20, wherein each side wall of the two components configuring the barrel is coupled to overlap radially with each other, and the first and second long holes form the slide hole in communication with each other in a condition radially overlapping with each other.

22. The writing instrument of claim 20 or 21, wherein the operation body is a clip body.