CLAIMS

1. A writing instrument comprising:

a writing instrument body provided with a pen point at a front end of a barrel; and

an ink cartridge connected to a rear end side of the writing instrument body, wherein

the ink cartridge includes a bottomed cylindrical container with an opened front end and a closed rear end and a plug fitted into an inner circumferential surface of an opening of the container,

the writing instrument body includes a projection that opens the ink cartridge when inserted into the opening of the container to press the plug rearward and a connecting portion that is formed separately from the projection and also surrounding the projection, and

the writing instrument body and the ink cartridge are in a connected condition by air tight fitting the opening of the container in the connecting portion.

2. The writing instrument according to claim 1, wherein the opening of the container is divided into plurality by the projection to form a plurality of longitudinal channels in an outer periphery of the projection, where at least one of the channels becomes an ink channel and at least one of the other channels becomes an air intake path.

3. The writing instrument according to claim 1 or 2, wherein the projection is provided with a plurality of longitudinal grooves on an outer peripheral surface.

4. The writing instrument according to claim 3, wherein each groove has an approximately identical radial cross sectional shape.

5. The writing instrument according to claim 1, wherein the connected condition is achieved by air tight fitting an outer peripheral surface of the opening of the container in an inner side surface of the connecting portion.

6. The writing instrument according to claim 5, wherein the connecting portion is in an axially extending cylindrical shape.

7. The writing instrument according to claim 6, wherein an air tight annular rib is formed on the inner side surface of the connecting portion and/or on the outer peripheral surface of the opening of the container.

8. The writing instrument according to any one of claims 5 through 7, wherein the opening of the container is divided into plurality by the projection to form a plurality of longitudinal channels on an outer periphery of the projection, at least one

of the channels becomes an ink channel and at least one of the other channels becomes an air intake path.

9. The writing instrument according to claim 1, wherein an intermediate member is press fitted in the barrel in a cylindrical shape of the writing instrument body and the connecting portion is provided behind a fitting portion of the intermediate member, and

a locking portion is formed on the intermediate member and also a locked portion is formed on an inner circumferential surface of the barrel, and when a rotating force is applied to the connecting portion, the locking portion makes contact with and locks the locked portion to restrict rotation of the intermediate member.

10. The writing instrument according to claim 9, wherein the locking portion and the locked portion are axially extending ribs.

11. The writing instrument according to claim 10, wherein a rotation preventing rib is formed on the intermediate member, a plurality of restricting ribs are formed radially on the inner circumferential surface of the barrel, and the rotation preventing rib is disposed between the adjacent restricting ribs.

12. The writing instrument according to claim 10, wherein a rotation preventing rib is formed on the inner circumferential surface of the barrel, a plurality of restricting ribs are formed radially in front of the fitting portion of the intermediate member, and the rotation preventing rib is disposed between the adjacent restricting ribs.

13. The writing instrument according to claim 11 or 12, wherein the restricting ribs are disposed radially at regular intervals on the inner circumferential surface of the barrel or the fitting portion of the intermediate member.

14. The writing instrument according to any one of claims 11 through 13, wherein a plurality of rotation preventing ribs is provided and disposed radially at regular intervals on the inner circumferential surface of the barrel or on the fitting portion of the intermediate member.

15. The writing instrument according to any one of claims 9 through 14, wherein the ink cartridge is screwed together with any one of the connecting portion, the intermediate member, and the barrel.

16. The writing instrument according to any one of claims 1 through 15, wherein an external thread is formed in any one of an inner surface of the barrel and an outer peripheral surface of the container and an internal thread is formed in the other, and air tight fitting of the connecting portion and the opening of the container proceeds in association with screwing of the external thread together with the internal

thread.

17. The writing instrument according to any one of claims 1 through 16, wherein the pen point provided at a tip end of the barrel is a marking pen tip and an ink absorber is provided in the barrel.

18. An ink cartridge constituting the writing instrument according to any one of claims 1 through 4 and 9 through 17, wherein the opening of the container has an inner circumferential surface air tight fitting an outer side surface of the connecting portion.

19. An ink cartridge constituting the writing instrument according to any one of claims 1 through 17, wherein the opening of the container has an outer peripheral surface of air tight fitting an inner side surface of the connecting portion.

20. An ink cartridge constituting the writing instrument according to claim 16, wherein any one of the external thread or the internal thread is formed in the outer peripheral surface of the container.

21. An ink cartridge constituting the writing instrument according to claim 17, wherein oil-based ink for writing board containing pigment, a resin, and a remover in a solvent is stored in the container.

CLAIMS

1. A writing instrument comprising:

a writing instrument body provided with a pen point at a front end of a barrel; and

an ink cartridge connected to a rear end side of the writing instrument body, wherein

the ink cartridge includes a bottomed cylindrical container with an opened front end and a closed rear end and a plug fitted into an inner circumferential surface of an opening of the container,

the writing instrument body includes a projection that opens the ink cartridge when inserted into the opening of the container to press the plug rearward and a connecting portion that is formed separately from the projection and also surrounding the projection,

the writing instrument body and the ink cartridge are in a connected condition by air tight fitting the opening of the container in the connecting portion, and

the opening of the container is divided into plurality by the projection to form a plurality of longitudinal channels in an outer periphery of the projection, where at least one of the channels becomes an ink channel and at least one of the other channels becomes an air intake path.

2. The writing instrument according to claim 1, wherein the projection is provided with a plurality of longitudinal grooves on an outer peripheral surface.

3. The writing instrument according to claim 2, wherein each groove has an approximately identical radial cross sectional shape.

4. The writing instrument according to claim 1, wherein the connected condition is achieved by air tight fitting an outer peripheral surface of the opening of the container in an inner side surface of the connecting portion.

5. The writing instrument according to claim 4, wherein the connecting portion is in an axially extending cylindrical shape.

6. The writing instrument according to claim 5, wherein an air tight annular rib is formed on the inner side surface of the connecting portion and/or on the outer peripheral surface of the opening of the container.

7. The writing instrument according to any one of claims 4 through 6, wherein the opening of the container is divided into plurality by the projection to form a plurality of longitudinal channels on an outer periphery of the projection, at least one

of the channels becomes an ink channel and at least one of the other channels becomes an air intake path.

8. A writing instrument comprising:

a writing instrument body provided with a pen point at a front end of a barrel; and

an ink cartridge connected to a rear end side of the writing instrument body, wherein

the ink cartridge includes a bottomed cylindrical container with an opened front end and a closed rear end and a plug fitted into an inner circumferential surface of an opening of the container,

the writing instrument body includes a projection that opens the ink cartridge when inserted into the opening of the container to press the plug rearward and a connecting portion that is formed separately from the projection and also surrounding the projection,

the writing instrument body and the ink cartridge are in a connected condition by air tight fitting the opening of the container in the connecting portion,

an intermediate member is press fitted in the barrel in a cylindrical shape of the writing instrument body and the connecting portion is provided behind a fitting portion of the intermediate member, and

a locking portion is formed on the intermediate member and also a locked portion is formed on an inner circumferential surface of the barrel, and when a rotating force is applied to the connecting portion, the locking portion makes contact with and locks the locked portion to restrict rotation of the intermediate member.

9. The writing instrument according to claim 8, wherein the locking portion and the locked portion are axially extending ribs.

10. The writing instrument according to claim 9, wherein a rotation preventing rib is formed on the intermediate member, a plurality of restricting ribs are formed radially on the inner circumferential surface of the barrel, and the rotation preventing rib is disposed between the adjacent restricting ribs.

11. The writing instrument according to claim 9, wherein a rotation preventing rib is formed on the inner circumferential surface of the barrel, a plurality of restricting ribs are formed radially in front of the fitting portion of the intermediate member, and the rotation preventing rib is disposed between the adjacent restricting ribs.

12. The writing instrument according to claim 10 or 11, wherein the restricting ribs are disposed radially at regular intervals on the inner circumferential surface of

the barrel or the fitting portion of the intermediate member.

13. The writing instrument according to any one of claims 10 through 12, wherein a plurality of rotation preventing ribs is provided and disposed radially at regular intervals on the inner circumferential surface of the barrel or on the fitting portion of the intermediate member.

14. The writing instrument according to any one of claims 8 through 13, wherein the ink cartridge is screwed together with any one of the connecting portion, the intermediate member, and the barrel.

15. The writing instrument according to any one of claims 1 through 14, wherein an external thread is formed in any one of an inner surface of the barrel and an outer peripheral surface of the container and an internal thread is formed in the other, and air tight fitting of the connecting portion and the opening of the container proceeds in association with screwing of the external thread together with the internal thread.

16. The writing instrument according to any one of claims 1 through 15, wherein the pen point provided at a tip end of the barrel is a marking pen tip and an ink absorber is provided in the barrel.

17. An ink cartridge constituting the writing instrument according to any one of claims 1 through 3 and 8 through 16, wherein the opening of the container has an inner circumferential surface air tight fitting an outer side surface of the connecting portion.

18. An ink cartridge constituting the writing instrument according to any one of claims 1 through 16, wherein the opening of the container has an outer peripheral surface of air tight fitting an inner side surface of the connecting portion.

19. An ink cartridge constituting the writing instrument according to claim 15, wherein any one of the external thread or the internal thread is formed in the outer peripheral surface of the container.

20. An ink cartridge constituting the writing instrument according to claim 16, wherein oil-based ink for writing board containing pigment, a resin, and a remover in a solvent is stored in the container.