

Description

Background of the invention

1. Field of the invention

The present invention relates to an inked ribbon cassette for being mounted on a printer carriage, and more particularly to an inked ribbon cassette having an ink replenisher for replenishing the inked ribbon with ink.

2. Description of the related art

There is known an inked ribbon cassette having an ink replenisher as shown in U.S. Patent No. 4,153,378, for example. The disclosed inked ribbon cassette includes an inked ribbon storage space partitioned to provide a chamber in which an ink cartridge is disposed. The ink cartridge supplies ink to a drive roller for driving the inked ribbon in a circulatory manner. Since the drive roller is held in contact with the inked ribbon, the ink supplied to the drive roller is fed to the inked ribbon.

The inked ribbon is of an endless configuration with a substantial length thereof being folded in the inked ribbon storage space. In printing operation, the inked ribbon is delivered from the storage space through one guide arm to an exposed portion where the inked ribbon can contact a print head. After the inked ribbon at the exposed portion has been pressed against a sheet of print paper by the print head to transfer ink to the sheet, the inked ribbon is passed through the other guide arm back into the storage space. This circulatory feeding process is repeated each time a printing operation is effected.

The ink in the inked ribbon is reduced in an amount right after it has been printed. However, since ink is supplied from the ink cartridge, the inked ribbon has a longer service life than would otherwise have.

The ink cartridge stores a small amount of ink because it is housed in the chamber in the inked ribbon storage space within the cassette. If a greater amount of ink were to be stored, then the inked ribbon cassette would be increased in size. The larger-size inked ribbon cassette would take up a larger installation space or impair an installation efficiency, and make it difficult to design a smaller and lighter printer.

Summary of the invention

It is an object of the present invention to provide an inked ribbon cassette including an ink replenisher which is rendered larger in size without reducing the size of an inked ribbon storage space.

Another object of the present invention is to provide an inked ribbon cassette having an improved installation efficiency.

Still another object of the present invention is to provide an inked ribbon cassette having an inked ribbon of an increased service life.

According to the present invention, the above objects can be achieved by providing an ink replenisher sharing one wall with an inked ribbon

cassette body and integrally formed with and positioned out of the ink ribbon cassette body. More specifically, an inked ribbon cassette according to the present invention comprises an inked ribbon, a container having an inked ribbon storage space in which the ink ribbon is stored, a drive roller for circulating the inked ribbon, a follower roller pressed against the driver roller for sandwiching the inked ribbon therebetween, an ink replenisher formed integrally out of the container and sharing one wall with the container, and a projection extending from the ink replenisher into contact with the follower roller for supplying ink from the ink replenisher through the follower roller to the inked ribbon.

The above and other objects, features and advantages of the present invention will become more apparent from the following description when taken in conjunction with the accompanying drawings in which preferred embodiments of the present invention are shown by way of illustrative example.

Brief description of the drawings

Fig. 1 is an exploded perspective view of an inked ribbon cassette according to a first embodiment of the present invention;

Fig. 2 is an exploded perspective view of an inked ribbon cassette according to a second embodiment of the present invention;

Fig. 3 is a plan view of an inked ribbon cassette according to a third embodiment of the present invention.

Description of the preferred embodiments

Fig. 1 shows an inked ribbon cassette according to a first embodiment of the present invention.

The inked ribbon cassette includes an inked ribbon cassette body 52 having an inked ribbon storage space 54 in which a substantial length of an inked ribbon 2 is stored, with one end of the inked ribbon 2 being exposed at a distal end portion 4. The inked ribbon 2 is gripped between a drive roller 5 and a follower roller 6 pressed against the drive roller 5, the rollers 5, 6 being disposed in the inked ribbon storage space 54.

The follower roller 6 is supported on a movable support member 7 which is normally urged by a spring 8 in a direction to push the follower roller 6 against the drive roller 5. The inked ribbon cassette is mounted on a printer carriage (not shown). The drive roller 5 is rotated about its own axis in the direction of the arrow by a drive force which is derived from the movement of the carriage in a character-spacing direction.

According to the first embodiment, an ink replenisher 51 has a thickness equal to that of a container composed of an inked ribbon cassette body 52 and a cover 53, the ink replenisher 51 being attached to the rear end of an inked ribbon storage space 54.

The ink replenisher 51 has attachment arms 56a, 56b having respective holes 55a, 55b and positioned on the opposite ends of one side thereof, from which a projection 14 extends lat-

erally. The inked ribbon cassette body 52 and the cover 53 have pins 57 which fit in the holes 55a, 55b to join the body 52, the cover 53, and the ink replenisher 51 together. When the body 52, the cover 53, and the replenisher 51 are thus assembled, the projection 14 is held in contact with the follower roller 6.

Fig. 2 shows an inked ribbon cassette according to a second embodiment of the present invention. Like or corresponding parts in Fig. 2 are denoted by like or corresponding reference characters in Fig. 1.

The inked ribbon cassette shown in Fig. 2 is basically of the same construction as that of the inked ribbon cassette illustrated in Fig. 1, except that a follower roller 61 and a movable support member 62 therefor are mounted on the side of an ink replenisher 60 to which attachment arms 56a, 56b are attached. The movable support member 62 is integrally formed with the ink replenisher 60, and is molded of a plastic material such as polyacetal for example. The movable support member 62 includes a resilient portion 62a having a thickness ranging from 0.5 to 1 mm for making the support member 62 springy so as to keep the follower roller 61 resilient against a projection 14. The other structural detail of Fig. 2 are the same as those of Fig. 1 and will not be described.

Fig. 3 illustrates an inked ribbon cassette according to a third embodiment of the present invention. The inked ribbon cassette of Fig. 3 is in fact a modification of the second embodiment. An ink replenisher 70 has a support member 71 attached to an end thereof such that the ink replenisher 70 is angularly movable about the support member 71 with respect to an inked ribbon cassette body. A spring 73 acts on the end of the ink replenisher 70 remote from the support member 71 for normally urging the ink replenisher 70 in a direction to press a follower roller 61 against a drive roller 5.

In the first through third embodiments, the thickness of the container of the ink replenisher can be identical to the thickness of the container of the inked ribbon cassette body, so that the ink replenisher is increased in size up to the thickness of the container of the inked ribbon cassette body. Therefore, the service life of the inked ribbon can be prolonged for allowing the inked ribbon cassette to be used for a longer period of time.

Since the ink replenisher is positioned out of the inked ribbon cassette body, it does not reduce the capacity of the inked ribbon storage space in the inked ribbon cassette body.

Although certain preferred embodiments have been shown and described, it should be understood that many changes and modifications may be made therein without departing from the scope of the appended claims.

Claims

1. Inked ribbon cassette comprising an inked ribbon (2), a container having an inked ribbon

storage space (54) in which said inked ribbon (2) is housed in a folded configuration, a drive roller (5) disposed in said container for circulating said inked ribbon (2); an ink replenisher (51) for supplying ink to said inked ribbon (2), said ink replenisher (51) being disposed on the same single level as said inked ribbon storage space (54), and a follower roller (6) which is held against said drive roller (5) for sandwiching said inked ribbon (2) therebetween characterized in that one of the side walls of said ink replenisher (51) is forming one wall of said inked ribbon storage space (54) and in that a projection (14) is provided which is projected from said side wall into contact with said follower roller (6) for supplying ink from said ink replenisher (51) through said follower roller (6) to said inked ribbon (2).

2. Inked ribbon cassette according to claim 1, characterized in that a support member (6) is provided which is so connected that it is horizontally rotatable on the same level as said inked ribbon (2) and circulates around one point of floor of said inked ribbon storage space (54) for supporting said follower roller (6) and in that a spring means (8) is provided for pressing said follower roller (6) against said drive roller (5).

3. Inked ribbon cassette according to claim 2, characterized in that said spring means is a spring (8) one end of which presses against said side wall of said ink replenisher (51) and the other end of which presses against said support member (7).

4. Inked ribbon cassette according to any of the preceding claims, characterized in that said ink replenisher (51; 60; 70) has a width which is substantially the same as that of said container.

5. Inked ribbon cassette according to claim 4, characterized in that said ink replenisher (51; 60; 70) is disposed on an extension of said inked ribbon storage space (54).

6. Inked ribbon cassette according to any of the preceding claims, characterized in that said ink replenisher (60; 70) includes an integral member (62) on which said follower roller (61) is supported.

7. Inked ribbon cassette according to claim 6, characterized in that said integral member (62) includes a resilient portion (62a).

8. Inked ribbon cassette according to any of the claims 2 to 7, characterized in that said ink replenisher (70) has a support member (71) attached to one end thereof and pivotally connected to said container, and spring means (73) on an opposite end thereof for normally urging said ink replenisher (70) to move in a direction toward said container.

Patentansprüche

1. Farbbandkassette mit einem Farbband (2), einem Behälter mit einem Farbband-Speicher-raum (54), in dem das Farbband (2) in einer gefalteten Konfiguration untergebracht ist, einer Antriebsrolle (5), die in dem Behälter angeordnet ist, um das Farbband (2) in Umlauf zu versetzen,



erally. The inked ribbon cassette body 52 and the cover 53 have pins 57 which fit in the holes 55a, 55b to join the body 52, the cover 53, and the ink replenisher 51 together. When the body 52, the cover 53, and the replenisher 51 are thus assembled, the projection 14 is held in contact with the follower roller 6.

Fig. 2 shows an inked ribbon cassette according to a second embodiment of the present invention. Like or corresponding parts in Fig. 2 are denoted by like or corresponding reference characters in Fig. 1.

The inked ribbon cassette shown in Fig. 2 is basically of the same construction as that of the inked ribbon cassette illustrated in Fig. 1, except that a follower roller 61 and a movable support member 62 therefor are mounted on the side of an ink replenisher 60 to which attachment arms 56a, 56b are attached. The movable support member 62 is integrally formed with the ink replenisher 60, and is molded of a plastic material such as polyacetal for example. The movable support member 62 includes a resilient portion 62a having a thickness ranging from 0.5 to 1 mm for making the support member 62 springy so as to keep the follower roller 61 resilient against a projection 14. The other structural detail of Fig. 2 are the same as those of Fig. 1 and will not be described.

Fig. 3 illustrates an inked ribbon cassette according to a third embodiment of the present invention. The inked ribbon cassette of Fig. 3 is in fact a modification of the second embodiment. An ink replenisher 70 has a support member 71 attached to an end thereof such that the ink replenisher 70 is angularly movable about the support member 71 with respect to an inked ribbon cassette body. A spring 73 acts on the end of the ink replenisher 70 remote from the support member 71 for normally urging the ink replenisher 70 in a direction to press a follower roller 61 against a drive roller 5.

In the first through third embodiments, the thickness of the container of the ink replenisher can be identical to the thickness of the container of the inked ribbon cassette body, so that the ink replenisher is increased in size up to the thickness of the container of the inked ribbon cassette body. Therefore, the service life of the inked ribbon can be prolonged for allowing the inked ribbon cassette to be used for a longer period of time.

Since the ink replenisher is positioned out of the inked ribbon cassette body, it does not reduce the capacity of the inked ribbon storage space in the inked ribbon cassette body.

Although certain preferred embodiments have been shown and described, it should be understood that many changes and modifications may be made therein without departing from the scope of the appended claims.

Claims

1. Inked ribbon cassette comprising an inked ribbon (2), a container having an inked ribbon

storage space (54) in which said inked ribbon (2) is housed in a folded configuration, a drive roller (5) disposed in said container for circulating said inked ribbon (2), an ink replenisher (51) for supplying ink to said inked ribbon (2), said ink replenisher (51) being disposed on the same single level as said inked ribbon storage space (54), and a follower roller (6) which is held against said drive roller (5) for sandwiching said inked ribbon (2) therebetween characterized in that one of the side walls of said ink replenisher (51) is forming one wall of said inked ribbon storage space (54) and in that a projection (14) is provided which is projected from said side wall into contact with said follower roller (6) for supplying ink from said ink replenisher (51) through said follower roller (6) to said inked ribbon (2).

2. Inked ribbon cassette according to claim 1, characterized in that a support member (6) is provided which is so connected that it is horizontally rotatable on the same level as said inked ribbon (2) and circulates around one point of floor of said inked ribbon storage space (54) for supporting said follower roller (6) and in that a spring means (8) is provided for pressing said follower roller (6) against said drive roller (5).

3. Inked ribbon cassette according to claim 2, characterized in that said spring means is a spring (8) one end of which presses against said side wall of said ink replenisher (51) and the other end of which presses against said support member (7).

4. Inked ribbon cassette according to any of the preceding claims, characterized in that said ink replenisher (51; 60; 70) has a width which is substantially the same as that of said container.

5. Inked ribbon cassette according to claim 4, characterized in that said ink replenisher (51; 60; 70) is disposed on an extension of said inked ribbon storage space (54).

6. Inked ribbon cassette according to any of the preceding claims, characterized in that said ink replenisher (60; 70) includes an integral member (62) on which said follower roller (61) is supported.

7. Inked ribbon cassette according to claim 6, characterized in that said integral member (62) includes a resilient portion (62a).

8. Inked ribbon cassette according to any of the claims 2 to 7, characterized in that said ink replenisher (70) has a support member (71) attached to one end thereof and pivotally connected to said container, and spring means (73) on an opposite end thereof for normally urging said ink replenisher (70) to move in a direction toward said container.

Patentansprüche

1. Farbbandkassette mit einem Farbband (2), einem Behälter mit einem Farbband-Speicher-raum (54), in dem das Farbband (2) in einer gefalteten Konfiguration untergebracht ist, einer Antriebsrolle (5), die in dem Behälter angeordnet ist, um das Farbband (2) in Umlauf zu versetzen,



einem Farbnachfüller (51) zum Versorgen des Farbband (2) mit Farbe, wobei der Farbnachfüller (51) in der gleichen Ebene wie der Farbband-Speicherraum (54) angeordnet ist, und einer mitlaufenden Rolle (6), die gegen die Antriebsrolle (5) gehalten ist, um hierzwischen das Farbband (2) aufzunehmen, dadurch gekennzeichnet, daß eine der Seitenwände des Farbnachfüllers (51) eine Wand des Farbband-Speicherraumes (54) bildet und daß ein Vorsprung (14) vorgesehen ist, der von der Seitenwand in Kontakt mit der mitlaufenden Rolle (6) vorspringt, um Farbe vom Farbnachfüller (51) über die mitlaufende Rolle (6) dem Farbband (2) zuzuführen.

2. Farbbandkassette nach Anspruch 1, dadurch gekennzeichnet, daß ein Trägerglied (7) vorgesehen ist, welches so verbunden ist, daß es horizontal in der gleichen Ebene wie das Farbband (2) rotierbar ist und um einen Punkt des Bodens des Farbband-Speicherraumes (54) rotiert, um die mitlaufende Rolle (6) zu tragen, und daß eine Federeinrichtung (8) vorgesehen ist, um die mitlaufende Rolle (6) gegen die Antriebsrolle (5) zu drücken.

3. Farbbandkassette nach Anspruch 2, dadurch gekennzeichnet, daß die Federeinrichtung eine Feder (8) ist, deren eines Ende gegen die Seitenwand des Farbnachfüllers (51) und deren anderes Ende gegen das Trägerglied (7) drückt.

4. Farbbandkassette nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Farbnachfüller (51; 60; 70) eine Breite aufweist, die im wesentlichen die gleiche ist wie diejenige des Behälters.

5. Farbbandkassette nach Anspruch 4, dadurch gekennzeichnet, daß der Farbnachfüller (51; 60; 70) auf einer Erweiterung des Farbband-Speicherraumes (54) angeordnet ist.

6. Farbbandkassette nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Farbnachfüller (60; 70) ein integrales Glied (62) umfaßt, auf welchem die mitlaufende Rolle (61) getragen ist.

7. Farbbandkassette nach Anspruch 6, dadurch gekennzeichnet, daß das integrale Glied (62) einen elastischen Abschnitt (62a) umfaßt.

8. Farbbandkassette nach einem der Ansprüche 2 bis 7, dadurch gekennzeichnet, daß der Farbnachfüller (70) ein Tragglied (71) aufweist, welches an seinem einen Ende befestigt ist und mit dem Behälter schwenkbar verbunden ist, sowie eine Federeinrichtung (73) an einem gegenüberliegenden Ende desselben, um den Farbnachfüller (70) normalerweise in eine Richtung zum Behälter hin zu drücken.

Revendications

1. Cassette pour ruban encré comprenant un ruban encré (2), un conteneur présentant un espace (54) d'emmagasinage du ruban encré dans lequel ledit ruban encré (2) est logé dans une configuration pliée, un galet d'entraînement (5) disposé dans ledit conteneur pour faire circuler ledit ruban encré (2), et un dispositif (51) de

réapprovisionnement en encre destiné à fournir de l'encre audit ruban encré (2), ledit dispositif (51) de réapprovisionnement en encre étant disposé sur le même niveau unique que ledit espace (54) d'emmagasinage du ruban encré, et un galet suiveur (6) qui est maintenu contre ledit galet (5) d'entraînement pour que ledit ruban encré (2) soit serré entre eux, caractérisée en ce que l'une des parois latérales dudit dispositif (51) de réapprovisionnement en encre forme une paroi dudit espace (54) d'emmagasinage du ruban encré et en ce qu'une saillie (14) est prévue, laquelle fait saillie de ladite paroi latérale jusqu'en contact avec ledit galet suiveur (6) pour alimenter en encre ledit ruban encré (2) depuis ledit dispositif (51) de réapprovisionnement en encre, par l'intermédiaire dudit galet suiveur (6).

2. Cassette pour ruban encré selon la revendication 1, caractérisée en ce que un élément (7) de support est prévu, lequel est relié de manière qu'il puisse tourner horizontalement sur le même niveau que ledit ruban encré (2) et il circule autour d'un point du fond dudit espace (54) d'emmagasinage du ruban encré pour supporter ledit galet suiveur (6), et en ce qu'un moyen à ressort (8) est prévu pour presser ledit galet suiveur (6) contre ledit galet (5) d'entraînement.

3. Cassette pour ruban encré selon la revendication 2, caractérisée en ce que ledit moyen à ressort est un ressort (8) dont une extrémité presse contre ladite paroi latérale dudit dispositif (51) de réapprovisionnement en encre et dont l'autre extrémité presse contre ledit élément (7) de support.

4. Cassette pour ruban encré selon l'une quelconque des revendications précédentes, caractérisée en ce que ledit dispositif (51; 60; 70) de réapprovisionnement en encre présente une largeur qui est sensiblement égale à celle dudit conteneur.

5. Cassette pour ruban encré selon la revendication 4, caractérisée en ce que ledit dispositif (51; 60; 70) de réapprovisionnement en encre est disposé sur un prolongement dudit espace (54) d'emmagasinage de ruban encré.

6. Cassette pour ruban encré selon l'une quelconque des revendications précédentes, caractérisée en ce que ledit dispositif (60; 70) de réapprovisionnement en encre comprend un élément intégré (62) sur lequel ledit galet suiveur (61) est supporté.

7. Cassette pour ruban encré selon la revendication 6, caractérisée en ce que ledit élément intégré (62) comprend une partie élastique (62a).

8. Cassette pour ruban encré selon l'une quelconque des revendications 2 à 7, caractérisée en ce que ledit dispositif (70) de réapprovisionnement en encre comporte un élément de support (71) relié à l'une de ses extrémités et relié de façon pivotante audit conteneur, et un moyen à ressort (73) sur son extrémité opposée pour rapeller normalement ledit dispositif (70) de réapprovisionnement en encre afin de la déplacer vers ledit conteneur.