

12

**EUROPEAN PATENT SPECIFICATION**

45 Date of publication of patent specification: **29.06.88**

51 Int. Cl.<sup>4</sup>: **B 41 J 3/20**

21 Application number: **84108431.2**

22 Date of filing: **17.07.84**

54 **Ribbon meandering preventing device for thermal printers.**

30 Priority: **10.09.83 JP 139625/83 u**

43 Date of publication of application:  
**03.04.85 Bulletin 85/14**

45 Publication of the grant of the patent:  
**29.06.88 Bulletin 88/26**

84 Designated Contracting States:  
**DE FR GB SE**

58 References cited:  
**GB-A-2 102 740**  
**US-A-3 707 215**  
**US-A-4 232 325**

73 Proprietor: **Kabushiki Kaisha Sato**  
**15-5, 1-chome, Shibuya**  
**Shibuya-ku Tokyo (JP)**

72 Inventor: **Oikawa, Tadahisa 19-chiwari 18-**  
**banchi**  
**Aza-kurosawa Kurosawajiri-cho**  
**Kirakami-shi Iwate-ken (JP)**

74 Representative: **Patentanwälte Grünecker, Dr.**  
**Kinkeldey, Dr. Stockmair, Dr. Schumann, Jakob,**  
**Dr. Bezold, Meister, Hilgers, Dr. Meyer-Plath**  
**Maximilianstrasse 58**  
**D-8000 München 22 (DE)**

**EP 0 135 693 B1**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European patent convention).

## Description

### BACKGROUND OF THE INVENTION

#### *Field of the Invention*

The present invention relates to a thermal printer in which a heat-sensitive transfer carbon ribbon is heated by a thermal head to have its carbon transferred to print labels in the form of a paper web (such a printer is known from GB—A—2 102 740) and, more particularly, to a ribbon meandering preventing device for use with a thermal printer, which prevents the carbon ribbon from meandering due to its slackness and/or swinging motion caused by the vibrations of the thermal head during the printing operation so that the carbon ribbon can be fed in a satisfactory state to the printing unit of the thermal printer.

#### *Description of the Prior Art*

Life Styles are diversified in accordance with the development of industry so that labels printed with data such as quality indications or kind controls are applied to all commodities. In accordance with the increase of demand, a great number of labels are required to make it urgent to develop a printer which is improved to meet that demand.

In the thermal printer of the above-mentioned type according to the prior art, the label web and a heat-sensitive transfer carbon ribbon for thermal transfer of the labels are fed together to a thermal head. As is well known in the art, the carbon ribbon is made so soft that it vibrates while it is intermittently being fed by the action of a step motor. If the carbon ribbon vibrates, it swings into the so-called "meandering run". Then, the abutting state of the carbon ribbon with the thermal head becomes unstable so that it possibly has its portion left unprinted or wrinkled to have a serious defect.

The meandering run is also caused as a result of slight change in the adjustment of the printing speed in view of the progress of the printing operation. In each meandering run, the thermal printer has to be checked and adjusted so that its printing operations become inefficient.

### SUMMARY OF THE INVENTION

The present invention has been proposed in view of the background thus far described and has an object to provide a ribbon meandering preventing device for a thermal printer, which can ensure clear prints without any deficient portion by preventing a heat-sensitive transfer carbon ribbon from vibrating.

According to a feature of the present invention, there is provided a ribbon meandering preventing device for a thermal printer, the features defined in claim 1.

### BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages of the present invention will become apparent from the following description taken with reference to the accompanying drawings, in which:

Fig. 1 is a sectional side elevation showing the

overall construction of a thermal printer which is provided with a ribbon meandering preventing device according to the present invention; and

Fig. 2 is a perspective view showing a ribbon correcting plate of the ribbon meandering preventing device of the present invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in Fig. 1, a paper web of labels A is let off from a label let-off roll 2 and is guided by a guide roller 3 to run via a label detector 4 to a platen 10 and a thermal head 11.

On the other hand, a heat-sensitive transfer carbon ribbon B is let off from a ribbon let-off roll 5 and is guided by a guide roller 8a, a ribbon detector 9 and a guide roller 8b. The two guide rollers 8a and 8b are pivoted on a supporting frame 7. The carbon ribbon B thus guided is pulled out to accompany, i.e., to run side by side with the aforementioned label web A at a ribbon correcting plate 17 of the ribbon meandering preventing device, in other words, immediately upstream of the aforementioned platen 10 and thermal head 11. As a result, the united tape of the label web A and the carbon ribbon B is fed to the plate 10 and the thermal head 11 so that carbon may be transferred to print the labels A one by one by the heat of the thermal head 11 in accordance with indicia which are selected and stored in advance. After this transfer-printing operation, the carbon ribbon B is guided by a guide roller 8c until it is taken up by means of a ribbon take-up roll 6.

In this meanwhile, the label web A printed in the carbon having the aforementioned desired indicia is cut by a rotary cutter 12, which is connected with the label detector 4, into the printed labels A of a predetermined size. These labels A are fed through a chute 13 to a label applicator 14 so that they may be applied to commodities or the like.

Here, a prime mover for running the label web A and the carbon ribbon B is a step motor 15 for intermittently revolving the platen 10. The revolutions of the step motor 15 are transmitted, too, to the rotary cutter 12 and the ribbon take-up roll 6 which has a slip structure.

Incidentally, reference numeral 16 appearing in Fig. 1 indicates a cooling fan for dissipating the heat during the heat transfer print by the thermal head 11.

Turning to Fig. 2, the ribbon correcting plate 17 of the ribbon meandering preventing device of the present invention is made of a thin plate having an elasticity and is cantilevered at 19, i.e., supported at its base end. More specifically, the ribbon correcting plate 17 has its base end fixed to the thermal printer 1 by fastening means 20 such as bolts or screws and its leading free end 18 rounded to allow the carbon ribbon B to smoothly run thereon while dragging the same.

Thus, the carbon ribbon B is guided to come into abutment against the free end edge 18 of the ribbon correcting plate 17 in the vicinity of the

feed side of the thermal head 11 so that it is tensed and guided to run side by side with the label web A. As a result, the slackness and/or meandering run of the carbon ribbon B, which are caused by the vibrations of the platen 10 being intermittently revolved, can be absorbed by that free end edge 18 of the ribbon correcting plate 17, which applies the tension and drag to the carbon ribbon B.

As has been described hereinbefore, according to the present invention, the ribbon correcting plate holding the elasticity is cantilevered in the vicinity of the feed side of the thermal head for supporting elastically and dragging the carbon ribbon immediately before the carbon ribbon is guided to run side by side with the label web. As a result, the device of the present invention can absorb the slackness and/or meandering run of the carbon ribbon to have an advantage that it can ensure the clear prints without any defficiency.

#### Claims

1. A ribbon meandering preventing device for a thermal printer (1) having a thermal printing head (11) and a ribbon correcting plate (17) for elastically supporting a heat-sensitive transfer carbon ribbon (B) and dragging the same before said carbon ribbon is guided to run side by side with a recording paper web (A) for a transfer-printing operation, said ribbon correcting plate (17) having its free end edge (18) rounded, being characterized in that said ribbon correcting plate (17) is cantilevered at its base end (19) and that its free end edge (18) is disposed immediately in the vicinity of the feed side of said thermal printing head (11) for tensing said ribbon to absorb the slackness and/or meandering run, if any.

2. A ribbon meandering preventing device as claimed in claim 1 being characterized in that said ribbon correcting plate (17) is stepped.

3. A ribbon meandering preventing device as claimed in claim 1 or claim 2 being characterized in that said ribbon correcting plate (17) is made of a thin elastic plate.

4. A ribbon meandering preventing device as claimed in one of claims 1 to 3 being characterized in that said base (19) of said ribbon correcting plate (17) is fixed to said thermal printer (1) by fastening means as a plurality of bolts or screws (20).

#### Patentansprüche

1. Vorrichtung für einen Wärmedrucker (1), welcher verhindert, daß sich das Farbband windet, mit einem Wärmedruckkopf (11) und einer Farbbandkorrekturplatte (17) zum elastischen Abstützen eines wärmeempfindlichen Übertragungskarbonsbandes (B) und zu dessen Ziehen, bevor das Karbonsband so geführt ist, daß es Seite an Seite mit einer Schreibpapierbahn (A) für einen Umdruckvorgang läuft, wobei die Farb-

bandkorrekturplatte (17) an ihrem freien Ende eine abgerundete Kante (18) aufweist, dadurch gekennzeichnet, daß die Farbbandkorrekturplatte (17) an ihrem Fußende (19) auskragt und daß die Kante (18) an ihrem freien Ende unmittelbar in der Nähe der Zuführseite des Wärmedruckkopfes (11) zum Spannen des Bandes angeordnet ist, um gegebenenfalls das Durchhängen und/oder den gewundenen Lauf aufzufangen.

2. Vorrichtung, welche verhindert, daß sich das Farbband windet, nach Anspruch 1, dadurch gekennzeichnet, daß die Farbbandkorrekturplatte (17) abgestuft ist.

3. Vorrichtung, welche verhindert, daß sich das Farbband windet, nach Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß die Farbbandkorrekturplatte (17) aus einer dünnen elastischen Platte hergestellt ist.

4. Vorrichtung, welche verhindert, daß sich das Farbband windet, nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß das Fußende (19) der Farbbandkorrekturplatte (17) an dem Wärmedrucker (1) durch Befestigungsmittel wie einer Vielzahl von Bolzen oder Schrauben (20) befestigt ist.

#### Revendications

1. Dispositif destiné à prévenir les méandres du ruban pour une imprimante thermique (1) ayant une tête d'impression thermique (11) et une plaque de correction du ruban (17) pour supporter élastiquement un ruban carbone à transfert thermosensible (B) et entrainer celui-ci avant que ledit ruban carbone ne soit guidé pour avancer côte à côte avec une bande de papier d'enregistrement (A) pour une opération d'impression par transfert, ladite plaque de correction du ruban (17) ayant son bord d'extrémité libre (18) arrondi, étant caractérisé en ce que ladite plaque de correction du ruban (17) est en porte à faux au niveau de son extrémité de base (19) et que son bord d'extrémité libre (18) est placé immédiatement à proximité du côté d'avance de ladite tête d'impression thermique (11) pour tendre ledit ruban afin d'absorber le relâchement et/ou parcours en méandres, s'il y a lieu.

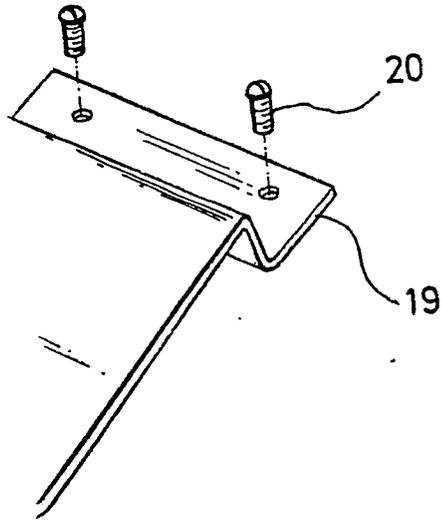
2. Dispositif destiné à prévenir les méandres du ruban comme revendiqué dans la revendication 1 étant caractérisé en ce que ladite plaque de correction du ruban (17) est étagée.

3. Dispositif destiné à prévenir les méandres du ruban comme revendiqué dans la revendication 1 ou la revendication 2 étant caractérisé en ce que ladite plaque de correction du ruban (17) se compose d'une fine plaque élastique.

4. Dispositif destiné à prévenir les méandres du ruban comme revendiqué dans l'une des revendications 1 à 3 étant caractérisé en ce que ladite extrémité de base (19) de ladite plaque de correction du ruban (17) est fixée à ladite imprimante thermique (1) par des moyens de fixation tels qu'un ensemble de boulons ou vis (20).



0 135 693



G.2