

[54] **CARTRIDGE FOR PRINTER CHARACTER STRIP**

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101/93 C

[51] Int. Cl. .... **B41j 1/20**

[58] Field of Search ..... 101/93 C, 111, 382 MV;  
197/53; 74/240-242; 206/56 R

[56] **References Cited**

**UNITED STATES PATENTS**

3,665,852	5/1972	Harrington.....	101/111 X
3,012,499	12/1961	Amada.....	101/111 X
3,188,947	6/1965	Paige.....	101/93 C
3,216,348	11/1965	Oldenburg et al. ....	101/93 C

3,224,366	12/1965	Cunningham.....	101/111 X
3,477,368	11/1969	Spaulding .....	101/111 X

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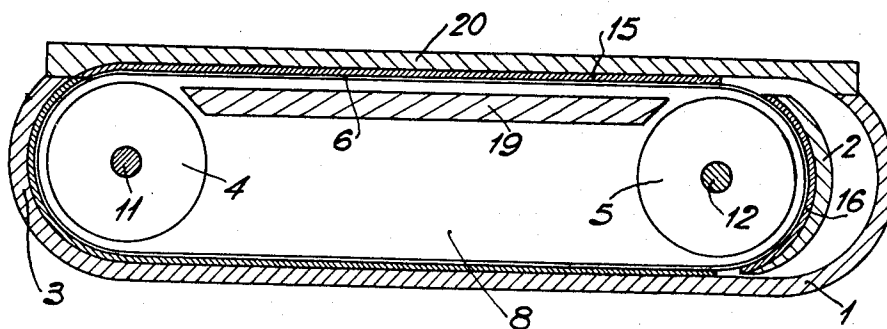
*Attorney, Agent, or Firm*—Fred Jacob

[57] **ABSTRACT**

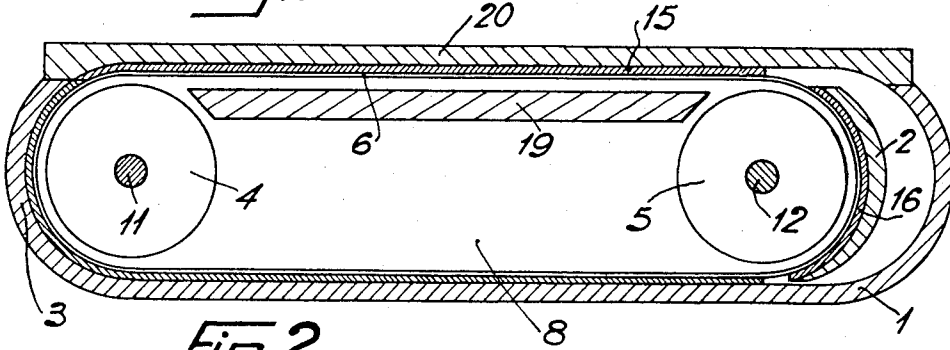
A cartridge is provided for an endless flexible character bearing band, which is non-extendible, for use on a printer including two rotating pulleys through which the above mentioned band slides, and with adjustable center-to-center distance.

The cartridge includes a housing which covers the pulleys and is expendable and retractable, at least in a direction parallel to the relative movement of the pulleys, depending on whether the pulleys move away from or towards each other. The cartridge includes means for maintaining said band flat against a portion of the inner walls of the housing, in relation to said pulleys when the outer edge of said portion is at most equal to the total length of said band and freeing said tape when the outer edge is greater than the total length of the band.

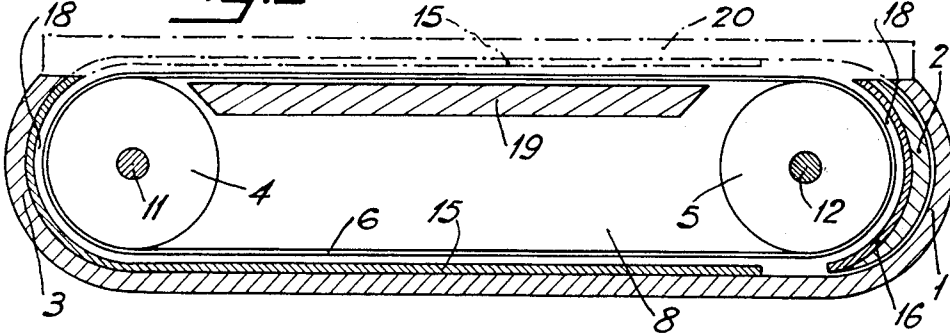
**10 Claims, 8 Drawing Figures**



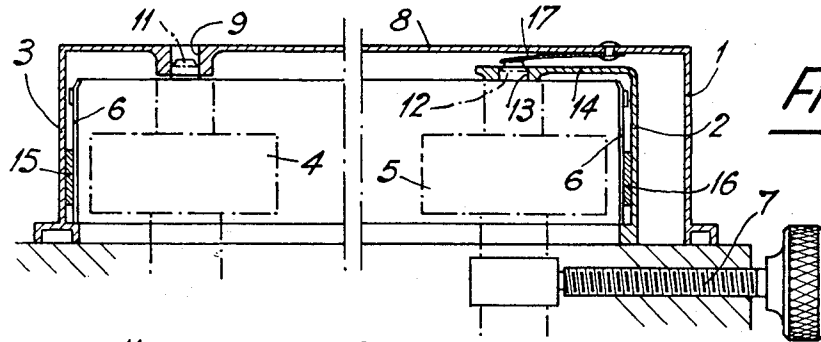
*Fig. 1*



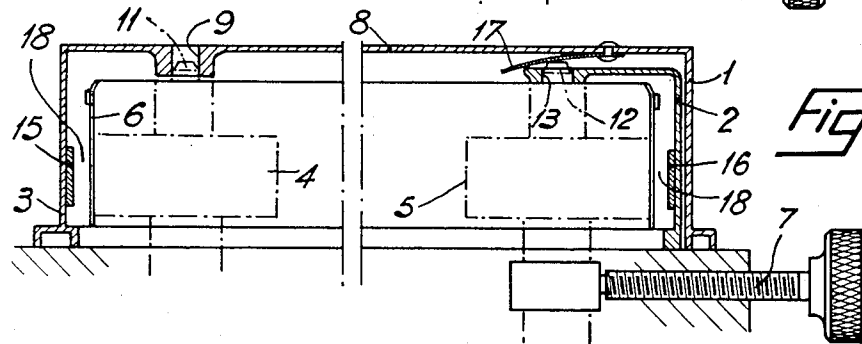
*Fig. 2*

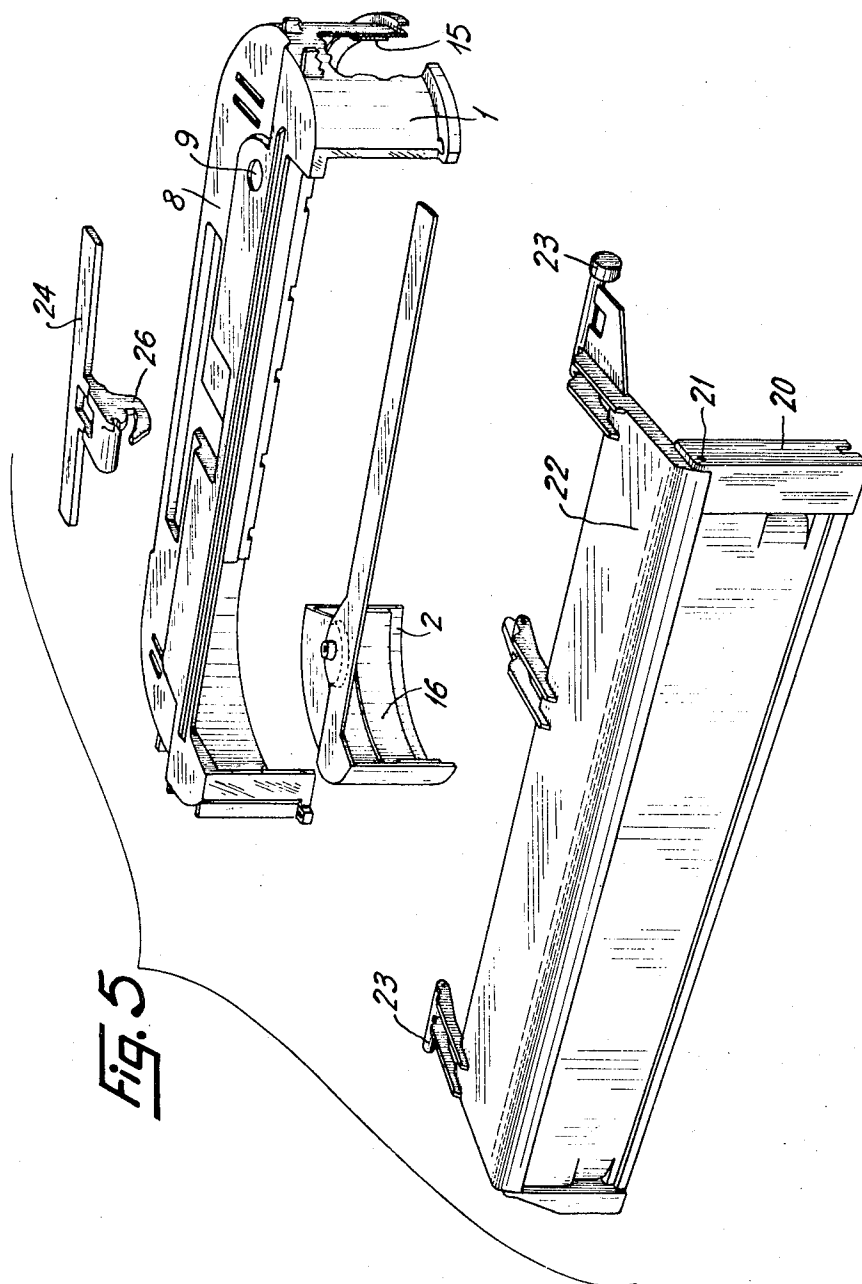


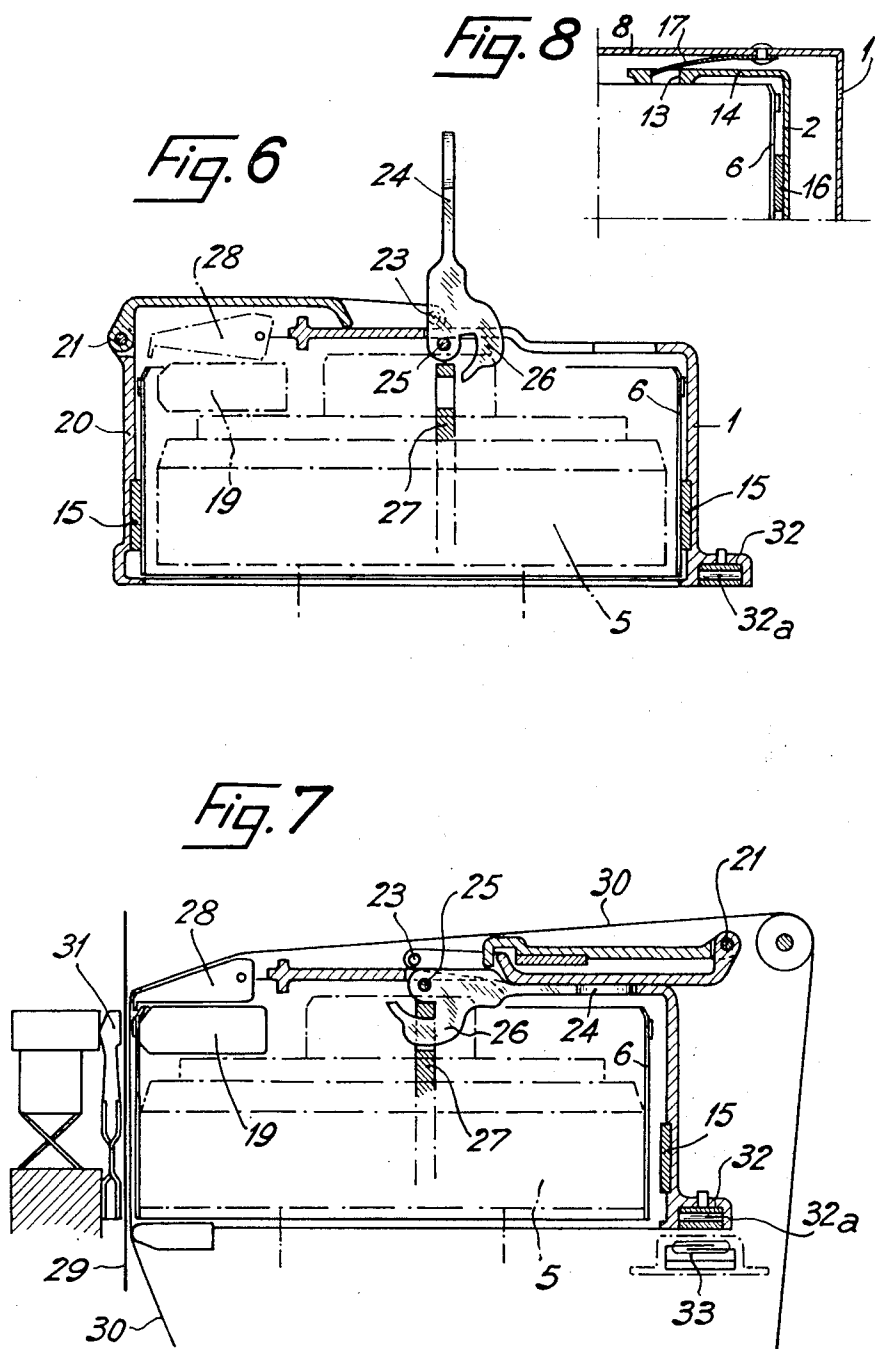
*Fig. 3*



*Fig. 4*







## CARTRIDGE FOR PRINTER CHARACTER STRIP

### BACKGROUND OF THE INVENTION

The present invention relates to a cartridge for a character-bearing band of a printing machine.

Printers with an endless flexible band equipped with elastic tongues which are mounted along said tape and which carry the characters at their free end are a known device. The strip is generally stretched over two rotating pulleys and forms an elongated loop consisting of two rectangular and parallel sections, along one of which the print hammers are arranged having anvils designed to cooperate with said characters which pass in front of them.

In order that the band may easily be changed, the distance from center to center of the axes of said pulleys is adjustable between a position in which the pulleys are closer to each other, which facilitates the mounting or removing of the slack band, and a position in which the pulleys are more distant one from the other which stretches the band and renders it ready for print.

During this operation, the band and its characters run the risk of being damaged. This also applies during storing of such band outside the machine. The mounting of the band, furthermore, is a relatively delicate operation.

The present invention corrects these shortcomings. For that purpose it is concerned with a removable cartridge which contains the band and makes possible the manipulation and the storing of the character-bearing band, without directly touching it.

### SUMMARY OF THE INVENTION

According to the invention, the cartridge for a flexible, endless, inextensible character-bearing band of a printer comprising two rotating pulleys over which said band passes and whose distance from center to center of the axes is adjustable between a close position of the pulleys in which the band is slack and a more distant position in which the band is stretched and ready for print, is distinguished in that it comprises a casing which is designed to surround said pulleys and which is expandible and retractable at least parallel to the direction of the relative movement of the pulleys, according to whether the latter move apart or approach each other, and which includes means, on the one hand, for keeping said band pressed against a part of the internal walls of the casing opposite said pulleys when the perimeter of said part is at the most equal to the total length of said band, and, on the other hand, for releasing it when said perimeter is longer than said total length of the band.

Preferably, the casing consists of two parts capable of sliding relative to each other parallel to the direction of the relative movement of the pulleys and made integral in translation, one with the axis of one of the pulleys and the other with the axis of the other pulley, for instance by insertion of the ends of said axes into corresponding recesses of said parts. Thus, the device for moving the pulleys apart and bringing them together also controls the expansion and the retraction of the cartridge.

When, as is usually the case, the character-carrying band is made of a material which is attracted by a magnet it is advantageous that the means designed to keep that band on the internal wall of the casing be mag-

netic. The means may be a strip of magnetic material arranged partially on one part of the casing and partially on the other of said parts. Hence when the parts of said casing are moved closer to each other and hold the character-bearing band one may cover said pulleys (also moved closer) with the casing, each of the parts having been solidly attached to the corresponding pulley axis (which provides the centering), the character-bearing band being positioned in front of said pulleys. When the pulleys are moved apart the two parts of the casing are separated and, consequently, the perimeter of the internal wall of the latter is increased. Since the character-bearing band is of a constant length it is detached from the strip of magnetic material, and is transferred to the pulleys. It is easy to see that a movement bringing the pulleys together provides for the return of the character-bearing band of the pulleys to the casing.

Thus, the cartridge according to the invention permits the mounting and removing of said band without direct manipulation, which prevents its deterioration. The cartridge, furthermore protects it in storage. The mounting is convenient since it is facilitated by the centering of the two parts of the casing by means of the pulley axes. Moreover, the invention permits the transfer of the band from the casing to the pulleys, and from these to the casing without changing the level of the characters. It is even easier to provide reference stops on the band and the casing so that the former always occupies the same position in storage relative to its cartridge, a position which corresponds with the initial position of the band in the printer.

One of the parts of the casing is preferably fixed and completely surrounds said pulleys, while the other part consists of a partition in the shape of a shell which is capable of sliding into the interior of the first part.

The character-bearing band comprises to best advantage a rectangular section which may be placed opposite the print hammers and the corresponding anvil, and the casing includes a removable wall corresponding with that rectangular section and giving access to the characters.

The cartridge according to the invention may be equipped with a projecting grip handle carrying bolting means capable of interaction with other means born by the printer, when the handle is turned down. This removable wall, moreover, cannot be moved to free the access to the characters unless said handle is turned down.

The cartridge should preferably comprise encoding media for the band which it contains signaling to the printer the nature of said band. Thus, the cartridge according to the invention makes possible the handling, mounting and setting in motion of the band with full reliability. Furthermore, it renders automatic the various operations of mounting, control, identification etc. of said band.

### BRIEF DESCRIPTION OF THE DRAWING

The figures of the attached drawing will facilitate an understanding of the way the invention is put into effect, wherein:

FIG. 1 is a longitudinal section in diagrammatic form, taken perpendicular to the pulley axes, illustrating the cartridge according to the invention and in the position in which the parts are close to each other;

FIG. 2 is a longitudinal section in diagrammatic form, taken perpendicular to the pulley axes, illustrating the cartridge according to the invention and in the position in which the parts are more distant one from the other;

FIG. 3 is a longitudinal section in diagrammatic form, taken parallel to the pulley axes, showing the cartridge according to the invention and in the position in which the parts are close to each other;

FIG. 4 is a longitudinal section in diagrammatic form, taken parallel to the pulley axes, showing the cartridge according to the invention in the position in which its parts are distant, one from the other;

FIG. 5 is an exploded perspective view of a preferred version of embodiment of the cartridge casing according to the invention;

FIG. 6 is a cross section of the casing of FIG. 5 in which the character-bearing band is still integral of the casing;

FIG. 7 is a cross section of the casing of FIG. 5 in the operating position; and

FIG. 8 shows the device for keeping the parts of the cartridge in the storage position.

Identical reference numerals in these figures denote identical elements.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

The cartridge shown in the FIGS. 1 to 4 is equipped with an oblong cover or casing 1, roughly in the shape of a trough, in whose interior a shell 2 may slide lengthwise, the shell being positioned close to one end of the cover, 1. For this purpose the shell 2 is fitted with a slide engaged in a slide bar installed in the cover 1 which renders said shell integral with the latter. The slide and the slide bar are not shown in FIGS. 1 to 4 for purposes of clarity. The shell 2 and the opposite end 3 of the cover 1 are of the same shape so as to conform to the shape of the drive pulleys 4 and 5 of the character-bearing band 6. These pulleys 4 and 5 are part of the printer (not shown). It is to be understood that the character bearing band 6 is of a conventional type and the construction thereof, except for its magnetic attractive characteristics, is in no way a part of this invention. The pulley 4 is a drive pulley, while the pulley 5 functions as a stretching device. For this purpose, it is capable of sliding under the action of a screw 7, for instance, whereby the distance from center to center of the axes of the pulleys 4 and 5 is modified.

The base 8 of cover 1 has an opening 9 in which the free end of the shaft 11 of the pulley 4 may be inserted. The diameter of the opening 9 corresponds with that of the end of shaft 11. The end of the shaft 12 penetrates into an opening 13 provided in a bracket 14 which is solidly attached to the shell 2 and whose diameter is slightly longer than that of said end. Thus the rotation of the screw 7 not only causes the movement of the pulley 5 in relation to pulley 4, but also the movement of the shell 2 in the interior of the cover 1.

The section of the internal surface of the lateral wall of the cover 1, bounded by the end 3 and the shell 2, is covered with a magnetic strip 15. In like manner, the concave surface of the shell 2, oriented toward the end 3, carries a magnetic strip 16. When the shell 2 is in its closest position to the end 3 the perimeter of the interior wall, bounded between the cover 1 and the shell 2, is equal to the total length of the character-bearing

band 6. Consequently, the band is maintained flat against the portion of the inner wall of the cover 1 bounded by the end 3 and the shell 2 through the magnetic attraction between the band and the magnetic strips 15 and 16. As shown by FIG. 8, the shell 2 is kept in this close position when outside the machine due to a curved elastic blade 17 attached to the base 8 of the cover 1, and having its free end entered into the opening 13.

In this position of the shell 2 in the cover 1, since the pulleys 4 and 5 have now moved close to each other and freely lie fully within the outline of the band (see FIGS. 1 and 3), it is possible to mount the cartridge on the printer in such a manner that the end of shaft 11 enters the opening 9, while that of the shaft 12 enters the opening 13 pushing back the blade 17 which comes out of opening 13 (FIG. 3), which permits the further sliding of the shell 2 (FIG. 4). The cover 1 and the shell 2 are designed in such a way that, in this position, there is a sufficiently wide peripheral passage 18 between them, the pulleys 4 and 5, the anvil 19, etc. so that the character-bearing band 6 runs no risk whatever of damage during the mounting and removal of the cover 1 on the machine.

When, from this position, the screw 7 is turned to move the pulleys 4 and 5 apart the shell 2 is shifted to the right of FIGS. 1 and 3. This results in the perimeter of the interior wall bounded between the cover 1 and the shell 2 becoming larger than the total length of the band 6. The latter detaches itself from the magnetized strips 16 and 17 and is transferred to the pulleys 4 and 5 (see FIGS. 2 and 4). The placing of the band 6 under full tension and the passage 18, prevent all contacts of the band 6 with the cartridge. It is easily understood that when the band 6 is set on the pulleys 4 and 5 a movement of the shell 2 in the reverse direction due to the movement of the pulley 5 towards the pulley 4 effects a foreshortening of the band and transfer of the band onto the internal wall of the cover 1 and onto the shell 2 is effected through the magnetic attraction between the band 6 and the magnetic strips 15 and 16 with the same reliability that applies to its mounting.

To enable the print hammers (not shown) to interact with the character-bearing band 6 and the anvil 19, the cover 1 includes a portion of a removable lateral wall 20. Thus, by means of the cartridge according to the invention it is possible to mount onto, and remove from a printer a character-bearing band without direct handling.

FIG. 5 shows a preferred mode of design of a cartridge according to the invention. In this version of embodiment the removable wall 20 is joined at 21 with a part 22 of the base 8 which in turn is connected with the latter at 23 so that it may be completely turned down over said base 8 in the print position (see FIG. 7).

Furthermore, this type of design offers a carrying handle 24, jointed at 25 with the base 8. This handle 24 is equipped with a hook 26 passing through said base 8 and is capable of interacting with the engagement means 27 in solid connection with the printer.

The shutters 20 and 22 cannot be turned down over the base 8 unless the handle 24 itself is turned down in that the handle normally lies in the path of the folding shutters. As a result one may only put the printer in the print position (see FIG. 7) when the cartridge cover 1 is clamped down by the intermediary of the hook 26

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and the engagement means 27. The cartridge may also include a protective arm 28 for the band which is operative only when the band is transferred to the pulleys. The arm 28 not being a part of the claimed invention no description of the operative means thereof is made here. The printer includes paper 29 and an ink ribbon 30 which are positioned between the hammers 31 and the band 6.

In its section oriented toward the printer the cartridge carries a number of grooves 32 in which there may be inserted magnets 32a, while the machine is equipped with magnetic contactors 33 opposite said grooves. It is thus possible to assign a magnetic code to each cartridge and the associated character-bearing band and to transmit that code to the printer through conventional magnetic readout means which of themselves are not a part of this invention.

It is quite apparent that associated with the cartridge and its various movable elements a great number of reliability devices may be provided to prevent all kinds of erroneous handling or defective operation. A reliable device has been designed which inhibits the opening of the wall section 20 as long as the handle 24 is not turned down so that the hook 26 is engaged in the engagement means 27.

What is claimed is:

1. A cartridge for an endless character bearing band, said cartridge being of a construction for normally storing a band in protected relation and for mounting the tape while still within the cartridge on spaced pulleys of a machine of the type having means for adjusting the spacing of the pulleys with the band assuming a configuration including a pair of runs joined by return portions, said cartridge comprising a casing having therein positioning means for reacting on the band for foreshortening the band and temporarily increasing the spacing between the runs thereof to facilitate the readily positioning of the band over the machine pulleys, said positioning means including a movable portion disposed adjacent one of the band return portions whereby when the cartridge is associated with the machine for the placing of the band thereon and the pulleys of the machine are moved apart, the band will be automatically grasped by the pulleys and completely drawn away from said positioning means.

2. The cartridge of claim 1 wherein there are means anchoring said positioning means movable portion to said casing in said band foreshortening position thereof, said anchoring means being a type automati-

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cally releasable when said cartridge and said band are cooperatively associated with the machine.

3. The cartridge of claim 2 wherein said cartridge has means for anchoring said cartridge against transverse movement relative to one machine pulley, said positioning means movable portion has means for anchoring the same against transverse movement relative to the other machine pulley, and movement of the machine pulleys in a transverse direction effects movement of said positioning means movable portion relative to said casing.

4. The cartridge of claim 3 wherein said means for anchoring said positioning means movable portion relative to the machine other portion includes a bore for receiving a pulley component, said means for anchoring said positioning means movable portion in the band foreshortening position thereof includes a latch member interlockable within said bore, and in the positioning of said cartridge on the machine, said latch member is automatically displaced.

5. The cartridge of claim 1 wherein said tape is magnetically attractive and said band positioning means are magnetic means.

6. The cartridge of claim 5 wherein said magnet means is in the form of strip material secured partially to said casing and partially forming part of said positioning means movable portion, said positioning means movable portion further including a casing section movable relative to said casing.

7. The cartridge of claim 1 wherein the cartridge is particularly adapted to be mounted on a printer having an anvil and a cooperating hammer, one run of said band is positionable between the anvil and the print hammer of the machine, and said casing has a removable wall disposed adjacent said one band run to permit coacting of said band with the hammer and anvil.

8. A cartridge according to claim 7, characterized in that said cartridge is equipped with a protruding grip handle fitted with means for interaction with other means mounted on the printer to clamp the cartridge in place when the handle is turned down.

9. A cartridge according to claim 8 wherein said handle prevents movement of said removable wall to a position permitting operation of the printer until the handle is turned to a cartridge clamping position.

10. A cartridge according to claim 1, characterized by means on the cartridge for coding of the band for signaling to the machine the nature of said band.

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