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(54) **Pressure shoe for a sewing machine with a cutting device for an inserted band or the like.**

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(56) References cited:
DE-C- 23 750
GB-A- 1 464 147
GB-A- 2 060 722
US-A- 3 468 269
US-A- 3 648 632

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Description

This invention concerns an improvement in or relating to pressure shoes for sewing machines, and in particular to a pressure shoe provided with a builtin cutting device.

Reference is made herein in particular to sewing machines and related devices, used nowadays in connection with fastening and elastic band to a hem, with the associated problem of curling thereof while said elastic band is being fastened thereto.

The pressure shoes presently used for said operation are pressure shoes designed for the passage of the elastic band only, which is tensioned by means of a special device, and cutting of the band at the end of operations is performed by means of a separate cutting device, close to the pressure shoe, nevertheless separate therefrom.

By means of said device, cutting of the elastic band takes place above the throat of the pressure shoe, whereby the distance between the sewing needle and the free edge of the elastic band after the cut remains quite high. In fact, since the elastic band is under tension to curl the fabric where it is being applied, once the cut has been made few centimeters of free elastic band will be left (i.e. not tensioned) and therefore plain stitches will be applied thereon.

Since it is required that at the beginning and at the end of operations the two ends of the elastic band are overlapped while curling the fabric, it will be compulsory to extend the seam for at least the exceeding part of the free elastic band overlaying the garment, which causes excessive thickness and stiffening of the garment, whereby a worse workmanship results, and quality is impaired.

A device of this type is shown in the U.S. Patent 3.648.632, adapted for cutting strips of different kinds, wherein the cutting device is positioned upstream of the needle path with respect to the feeding direction of the sewing machine.

An object of this invention resides in obviating the aforeasaid drawbacks and providing a simple and practical device whereby a band or tape can be cut at a really minimum distance away from the needle, so that a suitable overlap can be provided together with adequate strength of the seam, also when the latter is tensioned, while the junction that has to be provided is disguised in an optimized way. Obviously, obtaining a short free stretch of band or tape is convenient also in case the latter needs not to be overlapped.

The improvement in or relating the pressure shoes for subject sewing machines according to this invention resides in that the pressure shoe comprises a cutting device and a pressure pad provided with a slot at right angle to the feeding direction of said band or tape and upstream of the intersection point of the sewing needle path with said band or tape with respect to the feeding direction, said band or tape being passed through said slot from the top down, underneath said pressure pad, said cutting device being comprised of a counterknife fastened to an edge of said slot and a pivoting knife cooperating with said counter-knife, said knife being actuated through suitable actuating means against said counter-knife or cutting the band or tape.

More particularly, said pressure pad is provided with a small tube or duct for through passage of an air flow, acting behind said band or tape, when said band or tape is inserted through said slot in order to ease through passage and positioning thereof against counter-knife.

A further feature of the subject pressure shoe resides in that the cutting of said band or tape by means of said cutting device is performed at a distance of 0.5 to 1.5 cm away from the intersection point of sewing needle path with said band or tape, preferably of about 1 cm.

The pressure shoe according to this invention is further characterized in that according to an embodiment of the invention, the pivoting knife is horizontally mounted at a lower end of a substantially vertical pivot shaft movably inserted within a bearing support provided on pressure pad for a scissor-like action on said band or tape inserted between said knife and the counter-knife; at the upper end of said pivot shaft there being provided a substantially horizontal actuating member, the free end thereof being connected to said actuating means (mechanical, pneumatic and/or the like) for said pivoting knife actuation; resilient means provided to ensure the necessary pressure upon said knife being inserted between support and knife.

Another feature of the pressure shoe resides in that said pressure pad is provided with a side positioning member for said band or tape, comprising a steel wire member fastened sideways to the counter-knife and protruding downwards therefrom in order to provide a side abutment for said band or tape being fed through and underneath said pressure pad.

The invention is now discussed in detail referring in particular to the attached drawings wherein an exemplary and non limiting embodiment of the invention is shown, in which:

fig. 1 is a side elevational view of the subject pressure shoe;

fig. 2 is a top partial view of fig. 1;

fig. 3 is a top view of the lower portion of the pressure shoe, or pressure pad.

As it is apparent from the drawing, the subject sewing machine pressure shoe is a substantially conventional pressure shoe 1, wherein a slot 5 is designed to be provided on the pressure pad 3 thereof, in a direction at right angle to the moving direction of elastic band 5' (fig. 1); a stationary cutting block or counterknife 7 being provided on the downstream edge of said slot, while on the upstream edge there is mounted a pivoting knife connected to a suitable stationary support 9 wherein said pivoting knife can rotate with the desired angle.

Said pivoting knife essentially comprises an upward pivot shaft 11, adapted to rotate, as already said, within the suitable cylindrical seat of stationary support member 9, and at the lower end of said pivot shaft a cutting blade 13 is fastened, at right angle to pivot shaft 11, while at the top end an actuating member 15 is fastened, also at right angle to pivot shaft 11.

To said actuating member 15 there is connected the actuating means which can be mechanical, pneumatic, and/or the like, according to what the user desires.

In the subject embodiment said means are mechanical means (member 16 connected to actuating member 15).

The stationary cutter 7 is fastened to the pressure pad 3 through suitable fastening means 17, which are shown as screws in the drawing.

The stationary support member 9 as well is fastened to pressure pad 3 through suitable fastening means, for instance the screws 19.

On pivot shaft 11 of the pivoting knife a coil spring 21 is provided, which acts upon cutting blade 13, in order to subject said blade to the desired pressure, which is required to cut the elastic band in a proper manner.

Moreover, the pressure shoe is provided with a small air injection tube 23, which opens at 25 in slot 5; said air stream provides an easing function for passage of elastic band 5' through said slot, and it provides for positioning the same against cutting block 7.

For transverse positioning of the elastic band, on pressure shoe 1 there is provided steel wire 27, which projects sideways from cutting block 7 and underneath pressure pad 3; said steel wire pin 27 providing an abutment member for the elastic band, in order to avoid drifting thereof from the correct position.

A short description of the operation of the subject pressure shoe is deemed useful for a better understanding of the invention.

The elastic band 5'is inserted from above through slot 5 and therefrom it is eased to pass underneath pressured pad 3 according to the normal feed direction thereof (fig. 1).

During sewing on the garment the elastic band is tensioned in order to provide for curling of the hem of the garment where the band is being applied.

When the sewing operation is finished, the elastic band has to be cut in order to perform the overlap possibly necessary to complete the ring-like fastening thereof.

Due to the position of slot 5, and of counter-knife 7 cooperating with blade 13 of the pivoting knife, said stretch of elastic band free of tension, included between the cut and the intersection point of sewing needle path A with the elastic band (fig. 1) is extremely small, of the order ot about 1 cm, whereby the overlap performed over such a length is absolutely unobtrusive and does not impair quality of the garment.

Obviously, the subject pressure shoe, besides the application of an elastic band, can be used for sewing a tape of a stiff lace.

Claims

1. A sewing machine pressure shoe adapted for sewing a band or tape on a workpiece, said pressure shoe being provided with a pressure pad (3) and adapted to be mounted on a sewing machine provided with a sewing needle moving along a path and comprising a cutting device to cut said band or tape positioned upstream of said needle path with respect to the feeding direction of the sewing machine, characterized in that a slot (5) is provided on said pressure pad (3) at right angle to the feeding direction of said band or tape (5') and upstream of the intersection point of said sewing needle path (A) with said band or tape (5') with respect to the feeding direction, said band or tape (5') being passed through said slot (5) from the top down, underneath said pressure pad (3), said cutting device being comprised of a counter-knife (7) fastened to an edge of said slot (5) and a pivoting knife (13) cooperating with said counter-knife (7), said knife (13) being actuated through suitable actuating means (16) against said counter-knife (7) for cutting the band or tape (5').

2. A sewing machine pressure shoe according to claim 1, characterized in that said pressure pad (3) is provided with a small tube or duct (23) for through passage of an air flow, acting behind said band or tape (5') at (25), when said band or tape is inserted through said slot (5) in order to ease through passage and positioning thereof against counter-knife (7).

3. A sewing machine pressure shoe according to any of the above claims, characterized in that cutting of said band or tape (5') by means of said cutting device is performed at a distance of 0.5 to 1.5 cm away from the intersection point of sewing needle path (A) with said band or tape, preferably of about 1 cm.

4. A sewing machine pressure shoe according to any of the above claims, characterized in that the pivoting knife (13) is horizontally mounted at a lower end of a substantially vertical pivot shaft (11) movably inserted within a bearing support (9) provided on pressure pad (3), for a scissor-like action on said band or tape (5') inserted between said knife (13) and the counter-knife (7); at the upper end of said pivot shaft (11) there being provided a substantially horizontal actuating member (15), the free end thereof being connected to said actuating means (16) (mechanical, pneumatic and/or the like) for said pivoting knife actuation; resilient means (21) provided to ensure the necessary pressure upon said knife (13) being inserted between support 9 and knife (13).

5. A sewing machine pressure shoe according to any of the above claims, characterized in that said pressure pad (3) is provided with a side positioning member (27) for said band or tape (5'), comprising a steel wire member fastened sideways to the counter-knife (7) and protruding downwards therefrom in order to provide a side abutment for said band or tape (5') being fed through and underneath said pressure pad (3).

Patentansprüche

1. Stoffdrückerfuß für Nähmaschinen, eingerichtet für das Annähen eines Bandes oder Streifens an

ein Werkstück, wobei der Stoffdrückerfuß mit einer Drückerkufe (3) versehen und zur Anbringung an einer Nähmaschine eingerichtet ist, die mit einer sich entlang einer Bahn bewegenden Nähnadel versehen ist und eine Schneideeinrichtung umfaßt, um das Band oder den Streifen mit Bezug auf die Vorschubrichtung der Nähmaschine oberhalb der Nadelbahn abzuschneiden, dadurch gekennzeichnet, daß an der Drückerkufe (3) rechtwinklig zu der Vorschubrichtung des Bandes oder Streifens (5') und mit Bezug auf die Vorschubrichtung oberhalb des Kreuzungspunktes der Nähnadelbahn (A) mit dem Band oder Streifen (5') ein Schlitz (5) vorgesehen ist, das Band oder der Streifen (5') von oben abwärts durch den Schlitz (5) hindurch unter die Drückerkufe (3) geführt ist, die Schneideeinrichtung aus einem an einer Kante des Schlitzes (5) befestigten Gegenmesser (7) und einem mit dem Gegenmesser (7) zusammenwirkenden drehbar gelagerten Messer (13) besteht, das Messer (13) durch ein geeignetes Betätigungsmittel (16) gegen das Gegenmesser (7) zum Abschneiden des Bandes oder Streifens (5') betätigt ist.

2. Stoffdrückerfuß für Nähmaschinen nach Anspruch 1, dadurch gekennzeichnet, daß die Drückerkufe (3) mit einem Rohr oder Kanal (23) für den Durchtritt eines Luftstroms versehen ist, der bei (25) hinter dem Band oder Streifen (5') einwirkt, wenn das Band oder der Streifen durch den Schlitz (5) eingelegt ist, um dessen Durchtritt und Positionierung gegenüber dem Gegenmesser (7) zu erleichtern.

3. Stoffdrückerfuß für Nähmaschinen nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das Abschneiden des Bandes oder Streifens (5') mittels der Schneideeinrichtung in einem Abstand von 0,5 bis 1,5 cm, vorzugsweise von etwa 1 cm, entfernt von dem Kreuzungspunkt der Nähnadelbahn (A) mit dem Band oder Streifen durchgeführt wird.

4. Stoffdrückerfuß für Nähmaschinen nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das drehbar gelagerte Messer (13) horizontal an einem unteren Ende einer im wesentlichen vertikalen Drehwelle (11) befestigt ist, die beweglich innerhalb eines an der Drückerkufe (3) vorgesehenen Lagergestells (9) eingesetzt ist, für eine scherenähnliche Wirkung auf Band oder Streifen (5'), eingeführt zwischen Messer (13) und Gegenmesser (7); daß an dem oberen Ende der Drehwelle (11) ein im wesentlichen horizontales Betätigungsglied (15) vorgesehen ist, dessen freies Ende an das Betätigungsmittel (16) (mechanisch, pneumatisch und/oder dgl.) für die Betätigung des drehbar gelagerten Messers angeschlossen ist; daß zwischen dem Gestell (9) und dem Messer (13) eingesetzte Federmittel (21) vorgesehen sind, um den erforderlichen Druck auf das Messer (13) sicherzustellen.

5. Stoffdrückerfuß für Nähmaschinen nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die Drückerkufe (3) mit einem Positionierglied (27) für das Band oder den Streifen (5') versehen ist, welches ein seitlich von dem Gegenmesser (7) befestigtes Stahldrahtteil umfaßt und davon abwärts vorspringt, um ein Seitenauflager für das Band oder den Streifen (5') vorzusehen, das bzw. der durch und unter die Drückerkufe (3) geführt ist.

Revendications

1. Pied presseur de machine à coudre adapté à la couture d'une bande ou d'un ruban sur une pièce, ledit pied presseur étant muni d'un sabot presseur (3) et adapté à être monté sur une machine à coudre munie d'une aiguille à coudre se déplaçant le long d'un parcours et comprenant un dispositif de coupe pour découper ladite bande ou ledit ruban positionné en amont dudit parcours de l'aiguille par rapport à la direction d'alimentation de la machine à coudre, caractérisé en ce qu'une fente (5) est prévue dans ledit sabot presseur (3) à angle droit par rapport à la direction d'alimentation de ladite bande ou ledit ruban (5') et en amont du point d'intersection dudit parcours de l'aiguille à coudre (A) avec ladite bande ou ledit ruban (5') par rapport à la direction d'alimentation, ladite bande ou ledit ruban (5') étant passé par ladite fente (5) à partir du haut et vers le bas, au-dessous du sabot presseur (3), le dispositif de coupe étant constitué par un contre-couteau (7) fixé à un bord de ladite fente (5) et par un couteau pivotant (13) coopérant avec ledit contre-couteau (7), ledit couteau (13) étant actionné par des moyens d'actionnement appropriés (16) contre ledit contre-couteau (7) pour découper la bande ou le ruban (5').

2. Pied presseur de machine à coudre selon la revendication 1, caractérisé en ce que ledit sabot presseur (3) est muni d'un petit tube ou conduit (23) destiné au passage d'un courant d'air, agissant à l'arrière de ladite bande ou dudit ruban (5') en (25) quand ladite bande ou ledit ruban est inséré dans ladite fente (5) pour faciliter son passage et son positionnement contre le contre-couteau (7).

3. Pied presseur de machine à coudre selon l'une quelconque des revendications précédentes, caractérisé en ce que ladite découpe de ladite bande ou dudit ruban (5') au moyen dudit dispositif de coupe est réalisée à une distance comprise entre 0,5 et 1,5 cm du point d'intersection du parcours (A) de l'aiguille à coudre avec ladite bande ou ledit ruban, et est de préférence d'environ 1 cm.

4. Pied presseur de machine à coudre selon l'une quelconque des revendications précédentes, caractérisé en ce que le couteau pivotant (13) est monté horizontalement à une extrémité inférieure d'un arbre pivotant (11) sensiblement vertical, inséré de façon mobile à l'intérieur d'un support d'appui (9) prévu sur le sabot presseur (3), pour exercer une action semblable à celle de ciseaux sur ladite bande ou ledit ruban (5') inséré entre ledit couteau (13) et le contre-couteau (7); à la surface supérieure dudit arbre pivotant (11) il est prévu un organe d'actionnement (15) sensiblement horizontal, dont l'extrémité libre est reliée auxdits moyens d'actionnement (16) (mécaniques, pneumatiques et/ou analogues) pour l'actionnement dudit couteau pivotant; des moyens élastiques (21) prévus pour assurer la pression

nécessaire sur ledit couteau (13) étant insérés entre ledit support (9) et le couteau (13).

5. Pied presseur de machine à coudre selon l'une quelconque des revendications précédentes, caractérisé en ce que ledit sabot presseur (3) est muni d'un organe de positionnement latéral (27) pour ladite bande ou ledit ruban (5'), comprenant un fil d'acier fixé latéralement au contre-couteau (7) et faisant saillie vers le bas à partir de ce dernier pour constituer une butée latérale pour ladite bande ou ledit ruban (5') qui est alimenté à travers et au-dessous dudit sabot presseur (3).

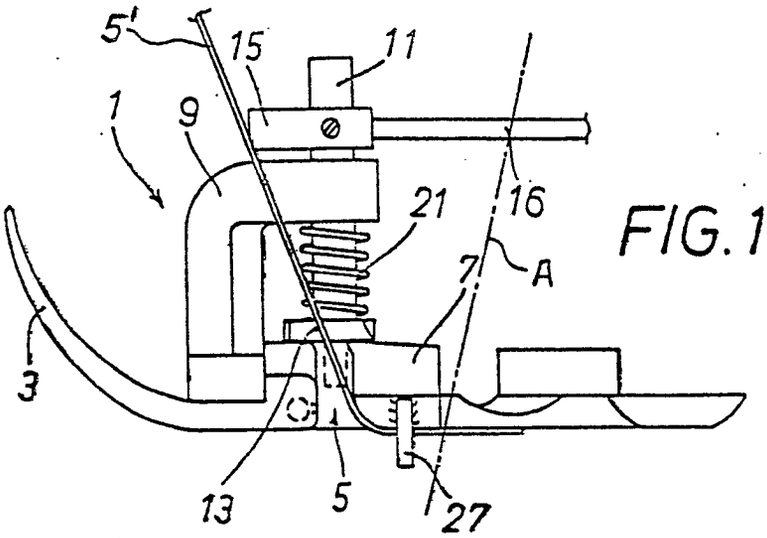

FIG. 1

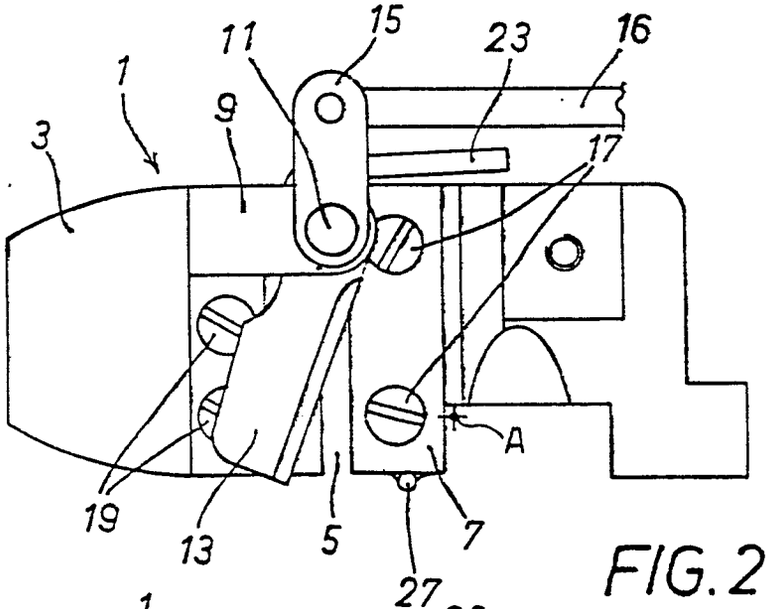

FIG. 2

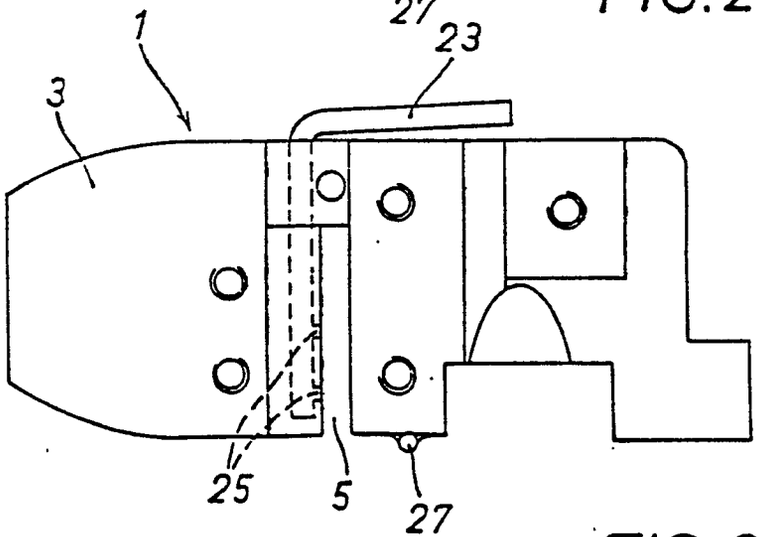

FIG. 3