May 12, 1970 R. B. HOWELL 3,511,201

PRESSER FOOT MOUNTING

Filed Oct. 2, 1968

Fig. 1.

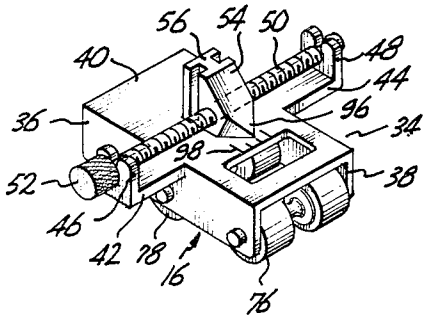


Fig. 2.

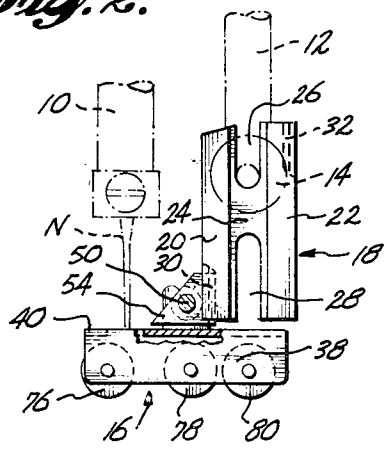


Fig. 4.

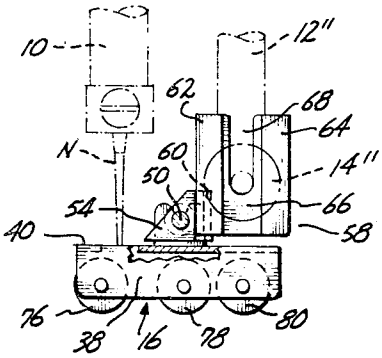
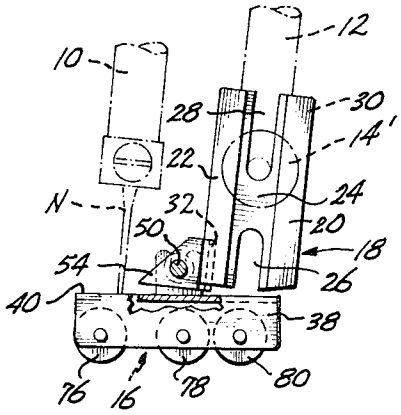


Fig. 3.



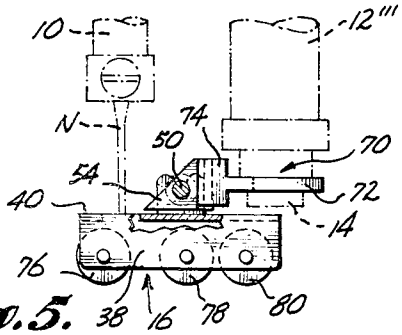
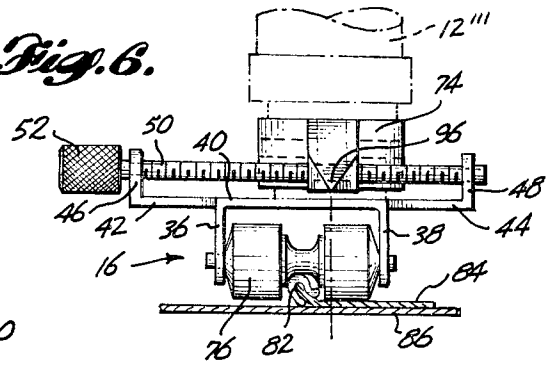


Fig. 5.

Fig. 6.



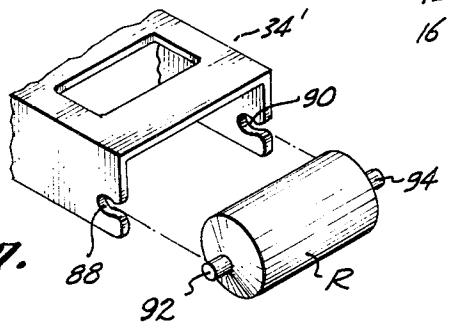


Fig. 7.

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3,511,201

PRESSER FOOT MOUNTING

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Continuation-in-part of application Ser. No. 678,742, Oct. 27, 1967. This application Oct. 2, 1968, Ser. No. 764,453

Int. Cl. D05b 29/12

U.S. Cl. 112—240 10 Claims

ABSTRACT OF THE DISCLOSURE

An elongated, transverse, rotatable adjustment screw is supported on an upper portion of a presser foot component. The screw extends through a threaded transverse bore in a connector block. The adjustment block includes one component of a joint between it and any one of a set of selectively usable mounting shanks. Each mounting shank is adapted for connection to a different type of presser bar.

CROSS REFERENCES TO RELATED APPLICATIONS

This is a continuation-in-part of my copending application Ser. No. 678,742, entitled Installation of Concealed Zippers and Presser Foot Attachments, filed Oct. 27, 1967, as a continuation-in-part of my then copending application Ser. No. 501,066, entitled Zipper Foot Attachment, filed Oct. 22, 1965, as a continuation-in-part of my earlier copending application Ser. No. 475,486, filed July 28, 1965, and entitled Universal Presser Foot Attachment. Application 475,486 issued as U.S. Pat. No. 3,342,151 on Sept. 19, 1967. Application Ser. No. 501,066 issued as U.S. Pat. No. 3,349,736 on Oct. 31, 1967.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates to presser foot assemblies for sewing machines, and more particularly to such assemblies for use in installing zippers or other types of elongated articles which need guiding during their installation, e.g., cording, piping, etc.

Description of the prior art

Known laterally adjustable presser foot assemblies are of two types. In the first type the adjustable connection comprises a member having a laterally elongated slot which receives the shank portion of a clamp screw. Examples of foot assemblies of this type are shown by Burgess 3,024,751 and Micale 3,294,048. The second type includes a slide joint having only two positions of use. The slidable member is retained in each of these positions by the pressure of a spring biased ball detent. This type of foot assembly is shown by Yoshida U.S. 3,098,460.

SUMMARY OF THE INVENTION

My aforementioned U.S. Pat Nos. 3,342,151 and 3,346,736, and my aforementioned application Ser. No. 678,742, disclose presser foot assemblies comprising a laterally adjustable foot component and a plurality of selectively usable mounting shanks, each connectable to a different type of presser bar. In such assemblies a slide joint is formed between the lower end of the mounting shank and a heel portion of the foot component. In use the foot component is held in position by friction forces existing at the slide joint. Lateral adjustment is effected by the user applying a sideways force on the foot component of sufficient magnitude to overcome the friction forces.

Presser foot assemblies of the present invention also comprise a laterally adjustable foot component and a plu-

rality of selectively usable mounting shanks. The foot component is characterized primarily by a transverse rod-like member which extends through a transverse bore formed in a connector block. The connector block includes one component of a two component joint. The mounting shanks include identical joint components which are the second component of said joint. In use the proper mounting shank is selected and is joined to the connector block. The mounting shank is secured to the presser bar of the sewing machine. The foot component is moved laterally relative to the connector block to place it in proper position relative to the needle.

In preferred form the transverse member is a rotatable adjustment screw and the bore in the connector block includes internal threads which mate with the external threads on the adjustment screw. Adjustment is easily and accurately effected by the user merely rotating the screw to cause its lateral travel through the connector block, attended by sideways movement of the foot component.

Other aspects of the invention relate to specific characteristic features and/or constructional details of the mounting shanks and the foot component. These more specific features are hereinafter described in detail in the section of this document entitled Description of the Preferred Embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a pictorial view of the foot component portion of a presser foot assembly typifying the present invention.

FIG. 2 is a side elevational view of the foot component of FIG. 1 installed at the lower end of a mounting shank of the high bar, straight needle type presser bar, with the reciprocating needle bar, the needle and the presser bar being shown in reference;

FIG. 3 is a view like FIG. 2, but with the mounting shank turned end-for-end and serving to mount the foot component onto the presser bar of a slant needle machine;

FIG. 4 is a view like FIGS. 2 and 3, but showing the use of a low bar mounting shank;

FIG. 5 is a view like FIGS. 2–4, but showing a mounting shank that is adapted for connection to an end clamp type presser bar;

FIG. 6 is a front elevational view of the foot component bein gused to install one type of invisible zipper; and

FIG. 7 is a fragmentary pictorial view of the front portion of a modified form of foot component, characterized by the front roller being removable and replaceable by a differently configured roller for performing a different sewing operation.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring specifically to FIG. 2, a reciprocating needle bar **10** (in reference) is shown spaced forwardly of a presser bar **12** of the upright high bar type. Bar **12** is equipped with a side clamp type of presser foot mounting mechanism, and when bar **12** is in its operative position such mounting mechanism is spaced relatively high above the needle plate (not shown).

The mounting mechanism comprises a flat side surface formed on the lower end portion of bar **12**, a threaded aperture entering into the side of said lower portion, substantially perpendicularly to both said flat side surface and the sewing path, and a clamp screw **14**. The flat side surface on bar **12** is parallel to the sewing path. The clamp screw **14** has a large head having a flat inner surface which is parallel to such flat side surface. Clamp screw **14** also includes a threaded shank that is threadable into and out from the aperture in the lower end portion of bar **12**.

In FIG. 2 a zipper foot assembly constructed according to the present invention is shown mounted in an operative position by the presser bar **12**. Such assembly consists of two interlocking parts: a foot component **16** and a high bar mounting shank **18**. The high bar mounting shang **18** is shown to be of channel form and to comprise a pair of spaced apart flanges **20**, **22** and a web **24** interconnected between corresponding edges of the flanges **20**, **22**. The end portions of web **24** are formed to each include an outwardly opening blind slot **26**, **28**. These slots are colinearly related. Identical joint components, shown in the form of vertically oriented slideways **30**, **32** are formed in diagonally opposed corners of the mounting shank **18**.

As best shown by FIG. 1, the foot component **16** comprises a body **34** having opposite side panel parts **36**, **38** and a top panel **40**. Top panel **40** includes a pair of oppositely projecting extensions **42**, **44** having upturned end portions **46**, **48** which are parallel to each other. The ears **46**, **48** include recesses for receiving reduced diameter end portions of an adjustment screw **50**. One end of the adjustment screw **50** is provided with a turning knob **52** spaced immediately outwardly from the ear **46**. A connector block **54** is mounted on the adjustment screw **50**. Block **54** includes a transverse bore through which the screw **50** exends. The bore is provided with internal threads which mate with the external threads on screw **50**. The block **54** is formed to include a joint component, illustrated in the form of a T-shaped tenon **56**. The joint components **30**, **32** are complementing mortises. Of course, the mortise and tenon elements may extend horizontally rather than vertically.

When the mounting block **54** is secured to the mouting shank **18**, as shown in FIG. 2, rotation of the screw **52** will cause such screw to move axially through the bore in the block **54**. Since screw **50** is part of the foot component **16** to move sideways relative to the mounting shank **18**, the presser bar **12** and the needle **10**.

It is within the scope of this invention to substitute a smooth, nonrotating rod for adjustment screw **50** and size the bore in block **54** so that it will frictionally grip such rod. In such embodiment a sideways force sufficient to overcome the friction forces between the rod and the mounting block is imposed on the foot component **16** in order to laterally adjust it in position.

As best shown by FIG. 2, the bottom surface of block **54** is spaced slightly above the top surface **40** of the foot component **16**. The bottom surface of mounting shank **18** is also spaced above the top surface **40**. This arrangement permits a limited amount of pivotal movement of the adjustment screw **50** and the foot component **16** secured thereto within the transverse bore in mounting block **54**. This movement of foot component **16** is caused by changes in the thickness of material below the foot component **16**. Such movement is herein termed a "pitch" movement since it resembles the pitching movement of a boat.

FIG. 3 shows the mounting shank **18** turned end-for-end and in the process of being used for mounting the foot component onto a slanted presser bar **12'** of a slant needle type sewing machine.

FIG. 4 shows a low bar type mounting shank **58** substituted in place of the high bar shank **18**. By definition, a "low bar" sewing machine is a sewing machine in which the side placed clamp screw on the presser bar is down low relatively close to the sewing surface. Mounting shank **58** is shown to include a joint component **60** of like construction to the joint components **30**, **32**. It is also of channel form and comprises a front flange **62**, a rear flange **64**, and an interconnecting web **66**. The joint component **60** is formed in the lower portion of the front flange **62**. An elongted blind slot **68** is formed in the upper portion ofthe web **66**.

FIG. 5 shows a presser bar **12'''** of the type having a clamp screw **14'''** in the lower end thereof. Accordingly,

the clamping surfaces (i.e. the lower end surface of the presser bar **12'''** and the inner flat surface of the clamp screw head) are horizontally oriented. For use in attaching the foot component **16** to this type of presser bar I have provided a third mounting shank **70**. Shank **70** comprises a horizontal panel **72** which is slotted in the same fashion as the webs **24**, **66**. The shank of the clamp screw **14'''** is received in such slot and the clamp screw **14'''** is turned so as to firmly secure the shank **70** in place. Shank **70** also includes a joint component **74** of the same type as joint components **30**, **32** and **60**.

Accordingly, it can be seen that the mounting shanks **18**, **58** and **70** are interchangeably usable for mounting the foot component **16** onto the four standard differing types of sewing machines. Reference is made to by aforementioned U.S. Pat. Nos. 3,342,151 and 3,349,736 for more detailed disclosures of the various types of presser bars for the different makes of sewing machines.

The foot component **16** is shown to be bascially of the same type as the preferred embodiment shown in my copending application entitled Presser Foot Assemblies, filed concurrently with the present application. It is shown to comprise three presser rollers **76**, **78**, **80**, all three of which are centrally grooved. The groove in the forward presser roller **76** is configured to serve as a guide avenue for a chain of zipper teeth **82** of the type shown in FIG. 6. In FIG. 6 the foot component **16** is shown to be positioned for sewing a tape **84** of an invisible zipper to a piece of material **86**. A material advance mechanism (not shown) is located below the material **86** and below that part of component **16** which rests on and presses downwardly against the tape **84**.

The space immediately rearwardly of the front roller **76** is open substantially entirely across the width of the foot component body **34**. The needle N is positioned in this space during sewing. A substantial laterally open space is necessary because the relative position of the needle N varies an amount greater than the width of the center groove in roller **76**. When the assembly is being used for sewing a right tape of a zipper the needle N is located to the immediate right of the right-hand shoulder portion of the center groove in roller **76**. When the opposite or left tape is being sewn it is necessary to slide the foot component **16** sideways to the right until the needle is to the immediate left of the left side shoulder.

For a more detailed disclosure of the rollers and variations of the foot component, reference is made to my aforementioned copending application entitled Presser Foot Assemblies. The disclosures of both of my aforementioned U.S. Pat. Nos. 3,342,151 and 3,349,736, and of my said application Ser. No. 678,742 and my application entitled Presser Foot Assemblies, are hereby expressly incorporated herein by reference.

Referring now to FIG. 7, the forward end portion of the body **34'** may be formed to include slot like openings **88**, **90** in the side panels **36**, **38** having entrance portions which are slightly narrower than the end shafts **92**, **94**, and inner circular portions which are slightly larger in diameter than the end shafts **92**, **94**. This construction permits the ready removal and reassembly of the forward guide roller, designated R in FIG. 7. This makes it possible to also interchange forward guide rollers so that the same foot component can be used for installing different types of zippers or other articles, (e.g. cording, piping, etc.) merely by substituting in a new front guide roller. The guide roller R shown in FIG. 7 is for use in doing ordinary sewing, hence, it is not grooved.

The front portion of the mounting block **54** may be pointed, with the point **96** serving as an indicator or marker which when lined up with some indicia mark **98** formed on the top panel **40**, or with the needle N, indicates that the guide groove is properly oriented with respect to the needle. The top panel **40** may be provided with several differing indicia marks **98**, each of which is

associated with a different one of the interchangeable rollers.

The foregoing description and the accompanying drawing together disclose specific embodiments which are within the scope of the present invention. The following claims, benefited by the doctrine of equivalents, serve to define the scope of the invention.

What is claimed is:

1. For use with a sewing machine equipped with a presser bar, a reciprocating needle and a material advancing mechanism, a presser foot assembly comprising:

a foot component including downwardly directed presser surface means;

a transverse member mounted atop said foot component;

a connector block;

connector means between said connector block and said transverse member rendering said connector block adjustable lengthwise of said transverse member and laterally of the sewing path;

mounting shank means;

means for removably connecting said mounting shank means to said connector block; and

means for removably connecting said mounting shank means to said presser bar.

2. A presser foot assembly according to claim 1, wherein said connector means mounts said connector block for limited pivotal movement about said transverse member and within a vertical plane, so that when the foot assembly is in place on a mounting bar the foot component is free to pitch slightly in response to variations in material thickness below it.

3. A presser foot assembly according to claim 1, wherein said transverse member is a rotatable adjustment screw having external threads and said connector block includes a transverse bore through which said screw extends, said bore having internal threads mating with the external threads on the adjustment screw, so that rotation of the screw when the connector block is attached to the presser bar by the mounting shank means causes sideways movement of the adjustment screw, and hence the foot component, relative to the assembly comprising the connector block, the mounting shank means and the presser bar.

4. A presser foot assembly according to claim 3, wherein said connector block includes a pointed front end portion usable as an alignment indicator.

5. A presser foot assembly to claim 1, wherein said foot component includes a presser roller mounted near the front end of the foot component, and indicia means on the foot component adjacent the path of relative travel of said indicator point, including an alignment mark for said roller.

6. A presser foot assembly according to claim 1, wherein said connector block comprises one component of a two component joint between it and the mounting shank means, and said mounting shank means comprises a plurality of different, selectively usable mounting shank members, each having an identical joint component constituting the second component of said joint, and each said mounting shank member being adapted for connection to a different type of presser bar.

7. A presser foot assembly according to claim 3, wherein said foot component includes a pair of opposite side extensions, each including an upwardly extending ear at the outer end thereof, with said ears including means journaling the opposite end portions of the adjustment screw for free rotation, and with said adjustment screw being threaded in its extent between the ears.

8. A presser foot assembly according to claim 7, wherein the connector block includes a bottom surface spaced above the top surface of the foot component and the mounting shank means includes a bottom surface that is also spaced above the top surface of the foot component, whereby relative pivotal movement of the interconnected connector block and mounting shank means is permitted about the adjustment screw within the limits of the spacing between the top surface of the foot component and the bottom surfaces of the connector block and the mounting shank means.

9. A presser foot according to claim 1, wherein said foot component includes guide avenue means formed in a lower portion thereof for guiding a chain of zipper teeth in a desired orientation past the needle.

10. A presser foot assembly according to claim 9, wherein said transverse member is a rotatable adjustment screw having external threads and said connector block includes a transverse bore thorugh which said screw extends, said bore having internal threads mating with the external threads on the adjustment screw, so that rotation of the screw when the connector block is attached to the presser bar by the mounting shank means causes sideways movement of the adjustment screw, and hence the foot component, relative to the assembly comprising the connector block, the mounting shank means and the presser bar.

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PATRICK D. LAWSON, Primary Examiner