July 29, 1969 K. H. KILLINGER ET AL 3,457,889

QUICK RELEASE PRESSER FEET

Filed Sept. 20, 1967

Fig.1.

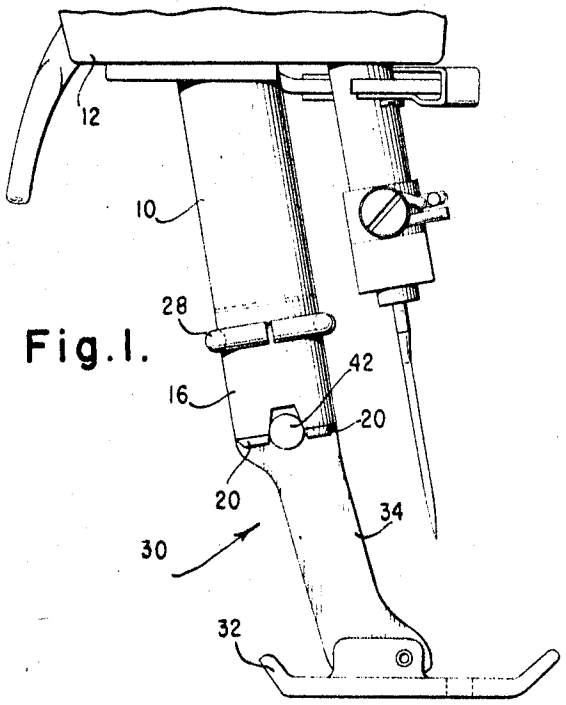


Fig.2.

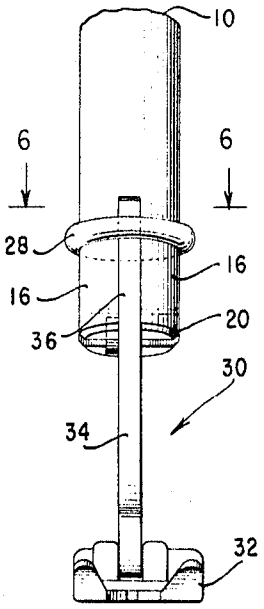


Fig.3.

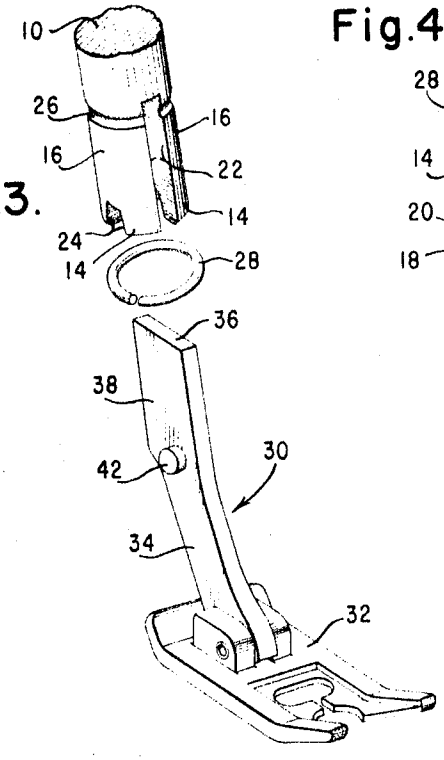


Fig.4.

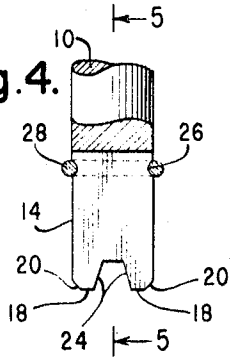


Fig.5.

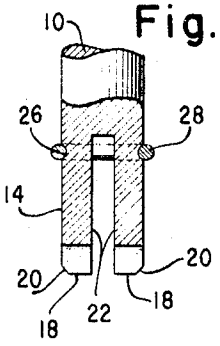
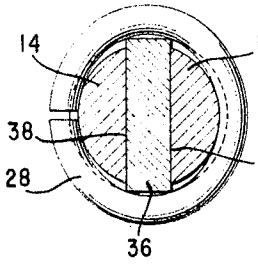


Fig.6.



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QUICK RELEASE PRESSER FEET

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U.S. Cl. 112—240 7 Claims

ABSTRACT OF THE DISCLOSURE

A screwless clamp arrangement that permits an operator quickly to release or secure a presser-foot to the presser-bar of a sewing machine. The arrangement utilizes a resilient member that releasably clamps the shank of the presser-foot to the presser-bar.

BACKGROUND OF THE INVENTION

The prior art discloses various types of quick release presser-foot securing means including the screwless variety. The present invention is an improvement over such prior art devices. Certain of such prior art devices are relatively expensive to produce due to costly production methods required to manufacture the devices. Other prior art devices are relatively difficult to use and still others were sufficiently bulky to interfere with the operator's view of the stitching point or work material. In some such prior art devices elements of the device are apt to loosen and become separated from the rest of the device causing the operator to waste time trying to locate the elements and then assemble the device.

SUMMARY OF THE INVENTION

The present invention comprises a sewing machine presser-bar formed in its lower end section with a substantially vertical slot adapted to receive the shank of a presser-foot. The presser-foot is releasably secured to the presser-bar by a resilient member mounted on the presser-bar.

The present invention solves the problems set forth above by providing a device that is simple and inexpensive to manufacture. Thus, the manufacturer need only provide a conventional needle-bar formed in its lower end section with two slots and a groove, a pressure-foot shank formed to fit one of the slots, a stud formed from or attached to the shank and a conventional radially collapsing split ring. The present invention is convenient to utilize because to secure the presser-foot in its operative position the operator need merely grasp the presser-foot with his hand and insert the pressure-foot shank into the presser-bar slot against the bias exerted by the ring. Since only one motion is required to mount or remove the presser-foot it can be accomplished very quickly and easily. The device of the present invention includes no elements that may loosen and become separated from each other and the only element that protrudes beyond the confines of the existing presser-bar is the split ring, which because of its small size offers practically no visual obstruction to the operator.

It is an object of the present invention to provide an improved quick release presser-foot securing means.

It is another object of the present invention to provide an improved screwless type of presser-foot clamping arrangement.

Having in mind the above and other objects that will be evident from an understanding of this disclosure, the invention comprises the devices, combinations and arrangements of parts as illustrated in the presently preferred embodiment of the invention which is hereinafter set forth

in such detail as to enable those skilled in the art readily to understand the function, operation, construction and advantages of it when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational side view of a portion of a sewing machine equipped with the elements that comprise the presser-foot clamping arrangement of the present invention.

FIG. 2 is a front elevational view of a section of the presser-bar and the presser-foot clamping arrangement of the present invention.

FIG. 3 is an exploded perspective view of the elements shown in FIG. 2.

FIG. 4 is a sectional view of a section of the presser-bar of the present invention.

FIG. 5 is a sectional view taken substantially along lines 5—5 of FIG. 4.

FIG. 6 is an enlarged sectional view taken substantially along line 6—6 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more in detail to the drawings there is shown in FIG. 1 a cylindrically shaped presser-bar **10** journaled in the head **12** of a sewing machine. The presser-bar **10** is bifurcated at its lower end section to form two legs **14** having outer surfaces **16** and end faces **18** which faces are beveled to form surfaces **20** that merge into the outer surfaces **16** and end faces **18** of the legs. A vertical slot **22** defined by the legs **14** is rectangular in cross section and extends transversely of notches **24** which are formed in, and open out of, the faces **18** of the legs. The notches **24** appear in cross section as vertex-truncated triangles with the bases formed by the open ends of the notches. A groove **26** that extends around the circumference of the needle-bar is formed in the outer surfaces **16** near the top of the legs **14**. A radially collapsing split ring **28** is disposed in the groove **26** which holds the ring against vertical movement on the needle-bar.

A presser-foot **30** is formed with a sole plate **32** to which is pivotally connected a substantially upstanding leg **34** formed with a shank **36** on its upper section. The shank **36** is rectangular in cross section and is formed with two oppositely disposed flat faces **38** and **40**. A cylindrically shaped stud **42** is formed on and extends outwardly from the face **38** near the lower end of the shank **36**. Although the depth of the shank **36** is substantially equal to the diameter of the presser-bar **10**, the slot **22** reduces the diameter at that point so that when the shank **36** is inserted in the slot it protrudes outwardly of the surface of the presser-bar and is gripped by the split ring **28**, as seen more clearly in FIG. 6.

The presently disclosed presser-foot arrangement has been designed to provide the operator with a means for rapidly exchanging presser-feet. Thus, to mount the presser-foot **30** the operator need only grasp the presser-foot with one hand and slip the shank **36** into the slot **22**, so that the stud **42** is vertically aligned with the notch **24** in the leg **14** on the left side (as viewed in FIG. 2) of the presser-bar, and then push the shank up as far as it will go. The mating of the stud **42** with the notch **24** in cooperation with the ring **28** prevents the presser-foot from pivoting forward or aft in the plane of the slot **22**, or in other words, in the line of sewing. As the shank **36** is slipped into the slot **22** it slides into the ring **28** forcing the ring to expand radially in the area where the shank contacts the ring, thereby distorting the ring into an elliptical shape, as seen more clearly in FIG. 6. Thus, the shank is frictionally held by the ring at the point of

ring-shank contact while the ring itself is held against vertical movement by the groove **26**, thereby locking the presser-foot to the presser-bar.

To release the presser-foot the operator need only grasp the presser-foot with one hand and pull it down to free the shank **38** from the frictional grip of the ring **28**. It is here noted that only a relatively small force is required to pull the shank free, therefore, any operator may easily remove or clamp the presser-foot to the presser-bar.

Having thus set forth the nature of this invention, what we claim herein is:

1. A quick release presser-foot arrangement for a sewing machine having a frame, comprising a presser-bar supported in said frame, a presser-foot which may be releasably secured to the presser-bar and a resilient member mounted on said presser-bar, said presser-bar being formed with a substantially vertical slot opening into at least one side wall of the presser-bar, said presser-foot having a shank formed to be received by said substantially vertical slot, means for supporting said resilient member on the presser-bar and for bringing said resilient member into operative relationship with said shank releasably to secure said presser-foot on said presser-bar, said means including a groove formed on said presser-bar to receive said resilient member, said resilient member being a radially collapsing split ring and said shank including a surface that protrudes through the slot opening in the side of the wall of the presser-bar to bring said shank into contact with said radially collapsing split ring, said ring acting to clamp said shank against said presser-bar thereby to hold said shank against vertical movement relatively to said presser-bar.

2. A quick release presser-foot arrangement for a sewing machine having a frame, comprising a presser-bar supported in said frame, a presser-foot which may be releasably secured to the presser-bar and a resilient member mounted on said presser-bar, said presser-bar being formed with a substantially vertical slot, said presser-foot having a shank formed to be received by said substantially vertical slot, means for supporting said resilient member on the presser-bar and for bringing said resilient member into operative relationship with said shank releasably to secure said presser-foot on said presser-bar, said resilient member being a radially collapsing split ring and said presser-bar being formed with a notch that opens out of the lower face of the presser-bar and extends transversely of said slot, and including a stud formed in said shank, said stud being received by said notch in cooperation with said split ring to prevent movement of the shank in the vertical plane of the said slot.

3. In a sewing machine having a presser-bar and a presser-foot carried thereby, means for releasably clamping the presser-foot to the presser-bar, said means comprising a shank forming part of the presser-foot, the lower section of the presser-bar being formed with a substantially vertical shank receiving slot, opening out of the lower end face of the presser-bar, that bifurcates the lower section of the presser-bar, the lower section of the presser-bar having formed in its outer face a groove that extends around the circumference of the presser-bar, said shank being formed to be received by said vertical presser-bar slot, and resilient means mounted in said groove and in frictional engagement with said shank for holding said shank within the vertical shank receiving slot against vertical movement relatively to said presser-bar.

4. In a sewing machine as set forth in claim **3** wherein said shank holding means includes a radially collapsing split ring which frictionally engages said shank when said shank is received by said slot.

5. In a sewing machine as set forth in claim **4** wherein said presser-bar is formed with a notch that opens out of the lower end face of the presser-bar and extends transversely of the slot and said shank is formed with a stud that engages said notch when the shank is inserted into the slot and the split ring, such arrangement preventing pivotal movement of the shank within the slot in the vertical plane of the slot.

6. In a sewing machine as set forth in claim **4** wherein said slot is rectangular in cross section, said shank is rectangular in cross section, said notch is a vertex-truncated triangle in cross section and said stud is cylindrical in shape.

7. A quick release presser-foot arrangement for a sewing machine having a frame, comprising a presser-bar supported in said frame, a presser-foot which may be releasably secured to the presser-bar and a resilient member mounted on said presser-bar, said presser-bar being formed with a substantially vertical slot, said presser-foot having a shank formed to be received by said substantially vertical slot, means for supporting said resilient member on the presser-bar and for bringing said resilient member into frictional engagement with said shank releasably to secure said presser-foot on said presser-bar.

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