June 13, 1967 R. J. ROSS 3,324,813

ATTACHMENT DRIVING STUD FOR A SCREWLESS NEEDLE-CLAMP

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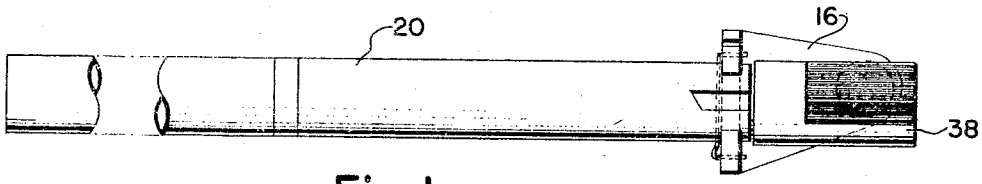


Fig. 1

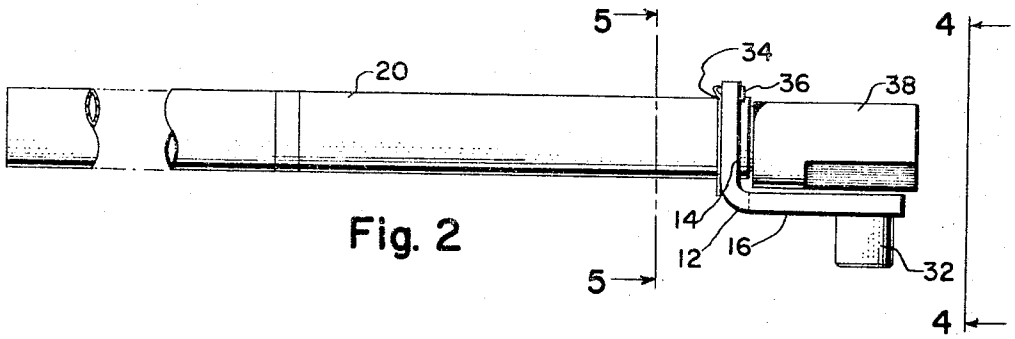


Fig. 2

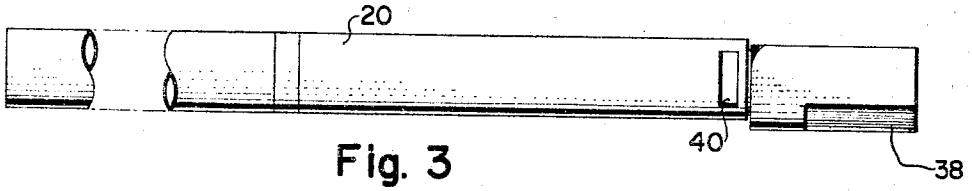


Fig. 3

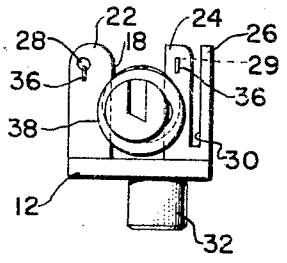


Fig. 4

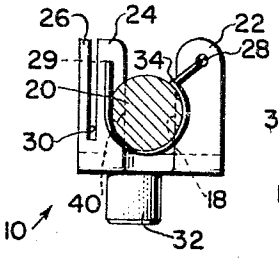


Fig. 5

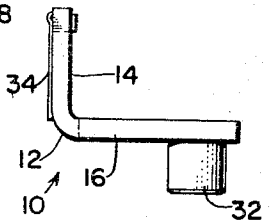


Fig. 6

INVENTOR.
ROGER J. ROSS
BY
Marshall J. Breen
ATTORNEY

WITNESS
Joseph V. Gillo

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ATTACHMENT DRIVING STUD FOR A SCREWLESS NEEDLE-CLAMP

Roger J. Ross, Dover, N.J., assignor to The Singer Company, New York, N.Y., a corporation of New Jersey

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The present invention relates to an attachment driving device for a sewing machine and more particularly, to such a device adapted to detachably mount upon a needle-bar that utilizes a screwless needle-clamp.

It is standard practice for sewing machine manufacturers to supply their customers with various removable attachments such as rufflers, zigzaggers, etc. which must be driven by utilizing the endwise reciprocating motion of the needle-bar. This may be accomplished by operatively connecting the attachment to a stud, whose primary function is to clamp the sewing needle to the needle-bar, whereby the reciprocating motion of the needle-bar connected stud serves to drive the attachment. However, where screwless needle clamps are employed such studs have been eliminated, giving rise to the problem of supplying a means to drive the aforementioned attachments.

Thus, it is an object of this invention to provide an improved attachment driving device for a sewing machine.

It is another object of the present invention to provide an attachment driving device for use with a needle-bar having a screwless type needle-clamp.

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 functions, operation, construction and advantages of it when used in conjunction with the accompanying drawings in which:

FIG. 1 is an elevational view of a needle-bar having a screwless type needle-clamp with an attachment driving device secured thereto,

FIG. 2 is an elevational view similar to FIG. 1 but shown rotated 90° therefrom,

FIG. 3 is an elevational view of the needle-bar with the attachment driving device removed,

FIG. 4 is a view taken along line 4—4 of FIG. 2,

FIG. 5 is a sectional view taken substntially along line 5—5 of FIG. 2, and

FIG. 6 is a side elevational view of the attachment driving device of the present invention.

Referring now more in detail to the drawings, wherein similar reference numerals identify corresponding parts throughout the several views **10** represents an attachment driving device substantially as shown.

Attachment driving device **10** includes a substantially L-shaped bracket **12** having an upper horizontal trifurcated limb **14** and a depending limb **16** integrally connected to the closed end of the upper horizontal limb. Upper horizontal trifurcated limb **14** is substantially rectangular in shape and includes a rectangular open-ended needle-bar slot **18** which is adapted to permit the operator to slip the attachment driving device **10** onto a needle-bar **20**, as will be more fully described hereinbelow. Upper horizontal trifurcated limb **14** comprises three parallel legs **22**, **24**, and **26**. Legs **22** and **24**, which combine to form needle-bar slot **18**, include wire clip holes **28** and **29** bored therethrough, and legs **24** and **26** combine to form an open ended slot **30** which may be utilized as a needle thread guide.

A cylindrically shaped connecting stud **32** is secured to the lower portion of depending limb **16** and extends laterally and outwardly therefrom. Sewing machine attachments (not shown) may be operatively connected to stud **32**, thereby providing a means by which the reciprocal motion of needle-bar **20** may be transmitted to the attachments.

A spring wire clip **34** having a pair of end portions **36** is employed to secure the attachment driving device **10** to the needle-bar **20**. Spring wire clip **34** is substantially U-shaped but has a relatively narrow neck portion which serves to lock the attachment driving device **10** to the needle-bar **20** after the driving device has been slipped onto the needle-bar. To secure clip **34** to the attachment driving device, ends **36** are passed through wire clip holes **28** and **29** in legs **22** and **24** and bent back along the underside of the legs, the main portion of the clip being pressed down to lie adjacent to and substantially parallel with the upper surface of limb **14** with the open end of the clip facing in the same direction as the open end of needle-bar slot **18**.

Needle-bar **20** includes a screwless type quick-release needle-clamp **38** which is the subject of a copending application, and will not be described herein. Notches **40** are cut out of opposite sides of needle-bar **20** at a point just above quick-release needle-clamp **38** thus defining a cross-section which is noncircular. The diameter of needle-bar **20** at notches **40** is slightly less than the width of rectangular slot **18**. The upper horizontal limb **14** is adapted to slide easily onto the lower notched end of needle-bar **20** with legs **22** and **24** of the horizontal limb engaging the respective notches **40**. However, since it is necessary to provide a means to lock bracket **12** in place on the needle-bar, spring wire clip **34** is incorporated into the design of the attachment driving device **10**. When the attachment driving device is slipped onto the needle-bar and legs **22** and **24** slide into notches **40**, the spring wire clip **34** engages needle-bar **20** above notches **40**. Since the diameter of the wire clip is less than the diameter of the needle-bar, the wire clip exerts a clamping action on the needle-bar and serves to lock bracket **12** to the needle-bar.

From the foregoing, it can be understood that a relatively inexpensive yet reliable and readily detachable snap-on attachment driving device is provided by the present invention. The attachment-driving device of the present invention adequately solves the problem created by quick-release needle clamps which do not include studs for driving attachments, without adding materially to the manufacturing cost. The attachment-driving device is constructed to facilitate easy removal from the needle bar when no attachments are being utilized, thereby to remove an unnecessary protuberance from the work area of the operator.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of my invention which is for purposes of illustration only and not to be construed as a limitation of the invention. All such modifications which do not depart from the spirit of the invention are intended to be included within the scope of the appended claims.

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

1. An attachment-driving device adapted for use on a sewing machine needle-bar fitted with a screwless needle-clamp, comprising, a substantially L-shaped bracket, said bracket including a horizontal bifurcated limb and a depending limb, an attachment driving stud connected to and extending laterally from said depending limb, and means for clamping said bracket to the screwless needle-bar including a spring wire member secured to said L-shaped bracket, whereby said attachment driving device

may be detachably mounted on the lower portion of said needle-bar.

2. In a sewing machine, in combination, an endwise reciprocatory needle-bar having a screwless needle-clamp, and a removably mounted attachment driving device, said last named device comprising a substantially L-shaped bracket defining a horizontal bifurcated limb and a depending limb connected to the closed end of said horizontal bifurcated limb, an attachment driving stud connected to and extending laterally from said depending limb and adapted to drive an attachment unit, said bifurcated limb defining an aperture, said needle-bar being received by the aperture, means for holding the attachment driving device in position when the attachment driving device is connected to the needle-bar.

3. In a sewing machine, a needle-bar having a screwless needle-clamp and a pair of notches on either side of the needle-bar, an attachment driving device mounted on said needle-bar and comprising an L-shaped bracket, said bracket including an upper horizontal limb having a pair of parallel legs defining a needle-bar receiving slot, said upper horizontal limb also including a thread guide slot, a depending limb integrally connected to the horizontal limb, a driving stud connected to and extending laterally from said depending limb, and a substantially U-shaped spring wire clip having its free ends connected to said legs, said substantially U-shaped spring wire clip in its untensioned state having a width near its open end less than the diameter of the needle-bar whereby said attachment driving device may be slipped onto the needle-bar, the legs fitting into the needle-bar notches, and the spring wire clip serving to lock the device in position.

4. A removably mounted attachment driving device for use with a sewing machine utilizing an endwise reciprocal needle-bar formed with a noncircular section and having a screwless type needle-clamp, comprising, a substantially L-shaped bracket having a horizontal bifurcated limb and a depending limb connected to the closed end of said bifurcated limb, a driving stud connected to and extending laterally of said depending limb and adapted to drive appropriate sewing machine attachments, and means for securing the bracket on said noncircular section of the needle bar.

5. In a sewing machine, in combination, an endwise reciprocatory needle-bar formed with a noncircular section and having a screwless needle-clamp, and an attachment driving device said device including a bracket, and means for removably securing said attachment driving device on said noncircular section of the needle-bar, said means including resilient means for removably securing said bracket to the needle-bar whereby the reciprocal motion of the needle-bar may be transmitted to appropriate sewing machine attachments utilized with the sewing machine.

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PATRICK D. LAWSON, *Primary Examiner.*

R. J. SCANLAN, JR., *Assistant Examiner.*