May 8, 1962 R. J. ROSS 3,033,137

ADJUSTABLE SHANK BUTTON CLAMP

Filed Sept. 12, 1960 2 Sheets-Sheet 1

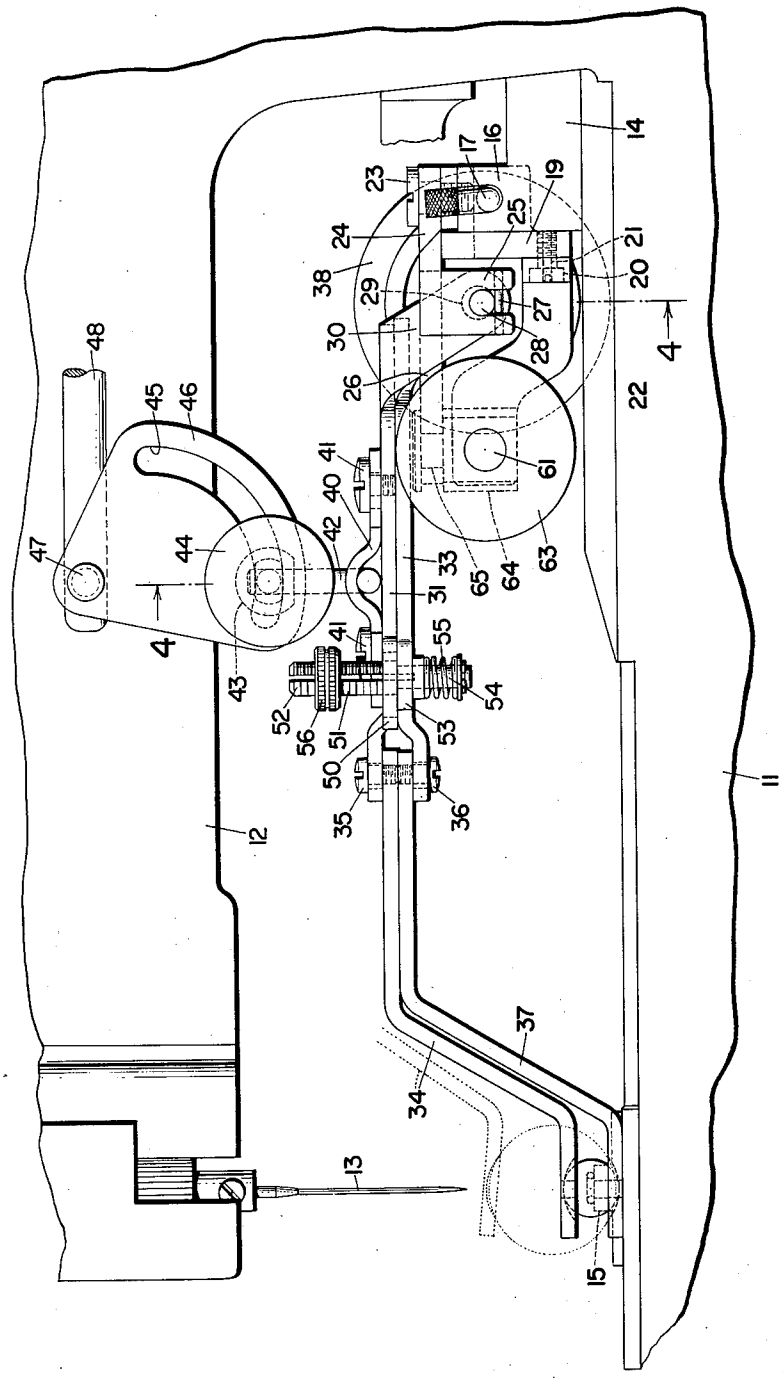


Fig. 1

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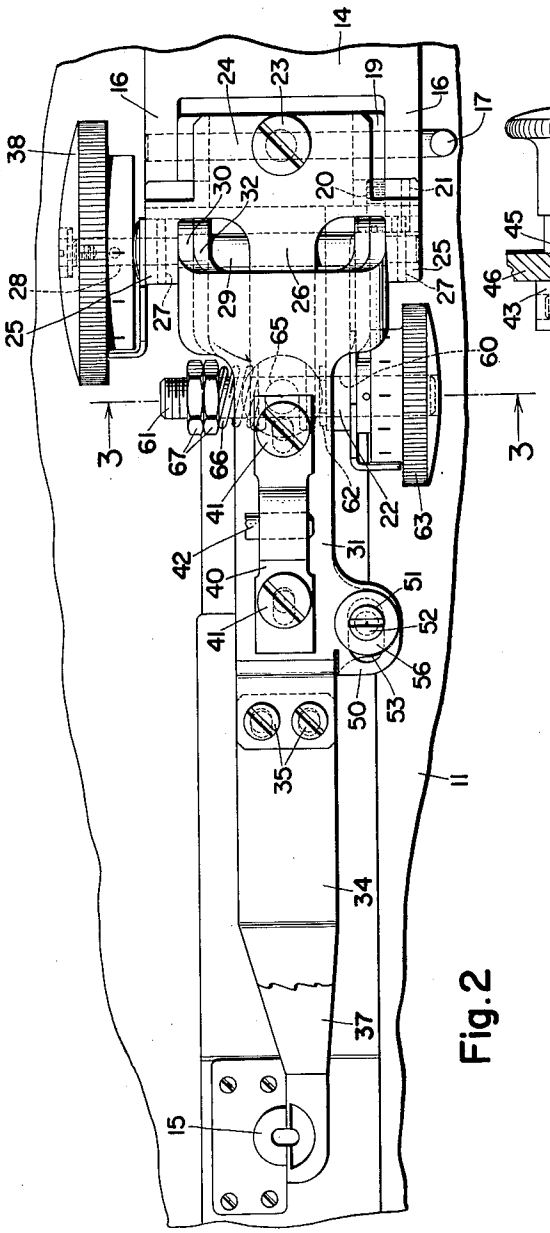


Fig. 2

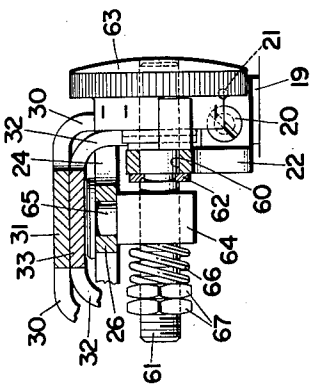


Fig. 3

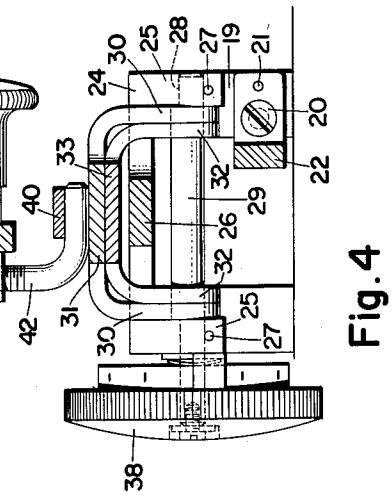


Fig. 4

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ADJUSTABLE SHANK BUTTON CLAMP

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This invention relates to article holding clamps for sewing machines and more particularly to a clamp for supporting, in a predetermined position at the stitching point of a sewing machine, any one of a class of articles such as shank buttons which may vary as to size and shape.

It is an object of this invention to provide a novel and improved article holding clamp for a sewing machine which is adaptable readily and conveniently to secure any one of a wide range of differently sized and shaped articles in a predetermined position relatively to the needle and work support of a sewing machine.

Another object of this invention is to provide a universally adjustable shank button clamp unit which may be applied in place of an ordinary clamp on a conventional sewing machine.

With the above and additional objects and advantages in view as will hereinafter appear, this invention comprises the devices, combinations, and arrangements of parts hereinafter described and illustrated in the accompanying drawings of a preferred embodiment in which:

FIG. 1 represents a side elevational view of a shank button holding clamp of this invention as applied to a sewing machine,

FIG. 2 represents a top plan view of the shank button holding clamp illustrated in FIG. 1,

FIG. 3 is a cross-sectional view taken substantially along line 3—3 of FIG. 2, and

FIG. 4 is a cross-sectional view taken substantially along line 4—4 of FIG. 1.

Referring particularly to FIG. 1 of the drawings, 11 denotes the work supporting bed for a conventional button sewing machine frame and 12 the bracket arm which extends over the work supporting bed. The sewing machine may be of the type disclosed in the United States McCann Patent No. 2,200,929 including an endwise reciprocatory needle 13 carried in the bracket arm and cooperating with a loop taker (not shown) beneath the work supporting bed to form stitches. As is conventional in button sewing machines of this type, a slidably pivoted work clamp base 14 is carried on the work supporting bed to which is secured a fabric supporting block 15 which moves integrally with the button holding clamp. The mechanism which serves to shift the work clamp base 14 relatively to the endwise path of reciprocation of the needle 13 causing the needle to penetrate alternately into and out of the button shank is not illustrated in the drawings and may be of the conventional type disclosed in the above referenced Patent No. 2,200,929.

The work clamp base 14 is formed with spaced upstanding ears 16 transversely apertured to accommodate a pin 17 by which the button holding jaws of the clamp are pivotally secured to the work clamp base. The pin 17 provides an axis about which the button holding jaws may be raised to release the work fabrics from fabric supporting block 15.

The button holding clamp of this invention comprises a block 19 which is fitted between the ears 16 of the work clamp base 14 and embraces the pin 17. Fixedly secured to the block 19 by a fastening screw 20 and a locating pin 21 is a bracket arm 22. Pivotally secured on a shoulder screw 23 threaded into the top of the block 19 is a clamp supporting plate 24 having downturned

bifurcated lugs 25 formed one of each side and a horizontally extending bifurcated lever 26.

Journaled transversely beneath the clamp supporting plate 24 and constrained in the downturned bifurcated lugs 25 by keeper pins 27 is a stud shaft 28 formed with an eccentric portion 29 extending between the lugs 25. Journaled on the eccentric portion 29 of the stud shaft 28, are the forked downturned arms 30 of an upper jaw supporting member 31 and the forked downturned arms 32 of a lower jaw supporting member 33. As best illustrated in FIG. 1, an upper button gripping jaw 34 is secured by screws 35 to the upper jaw supporting member 31, and similarly screws 36 secure a lower button gripping jaw 37 to the lower jaw supporting member 33. The button gripping jaws 34 and 37 may be shifted as a unit lengthwise of the work supporting bed by turning the stud shaft 28 and for facilitating this adjustment, the stud shaft 28 is fitted with a knurled hand wheel 38. The button gripping jaws 34 and 37 engage on opposite sides of the periphery of the button as shown in FIG. 1 wherein it is illustrated in dotted lines that large diameter buttons cause the top jaw 34 of the clamp to be turned about the stud shaft 28 to a greater degree than do small diameter buttons. By means of the knurled hand wheel 38 and the eccentric portion 29 of the stud 28, the shank at the center of the button may be aligned accurately with the path of the needle when buttons of different peripheral diameter are to be stitched.

For raising and lowering both the upper and lower button gripping jaws 34 and 37, an arched plate 40 is secured by screws 41 to the upper jaw supporting member 33 and constrains thereon an L-shaped pin 42 threaded into a block 43 which is secured by a clamp nut 44 along an arcuate slot 45 formed in an adjusting block 46 pivoted at 47 to a clamp raising lever arm 48 carried on the sewing machine bracket arm 12. The lever arm 48 is biased downwardly as viewed in FIG. 1 as by spring means (not shown) and may be raised by conventional treadle operated mechanism. The center of curvature of the arcuate slot 45 is preferably spaced from the pivot 47 such that by adjustment of the block 43 along the slot, the range of motion of the L-shaped pin 42 and consequently of the upper jaw supporting member 33 may be adjusted commensurate with the peripheral size of the button to be gripped.

The upper jaw supporting member 31 is formed with an offset tab 50 apertured as illustrated in FIG. 1 slidingly to accommodate the enlarged threaded portion 51 of a stud 52. Beneath the tab 50, the lower jaw supporting member 33 is formed with a tab 53 which is apertured slidingly to accommodate a depending cylindrical portion 54 of the stud 52 which is of smaller diameter than the threaded portion 51. A spring 55 constrained on the cylindrical portion 54 of the stud 52 biases the shoulder provided by the enlarged threaded portion of the stud downwardly against the tab 53 on the lower jaw supporting member. A nut 56 on the threaded portion 51 provides an adjustable stop against which the tab 50 of the upper jaw supporting member 31 abuts when it is raised so as to entrain, upon continued upward movement, the stud 52, the spring 55 and consequently, the lower jaw supporting member 33.

When the clamp raising lever arm 47 is turned upwardly as viewed in FIG. 1, the upper button gripping jaw will, therefore, first separate from the lower button gripping jaw to release the button and then the lower button gripping jaw will be raised to release the work fabrics from the fabric supporting block 15.

For aligning with the path of reciprocation of the needle the shank aperture of buttons of different shank length, the bracket arm 22 fixed to the block 19 is apertured transversely as at 60 and, as best illustrated in

FIGS. 2 and 3, a threaded stud **61** is journaled in the aperture **60** of the bracket arm **22**. By means of a split ring **62** on the stud **61** at one side of the bracket arm **22** and a knurled hand wheel **63** on the stud at the opposite side of the bracket arm, the stud is constrained axially relatively to the bracket arm but may be turned freely thereon. Threaded on the stud **61** is a block **64** carrying a headed pin **65** which is embraced by the bifurcated lever arm **26** of the clamp supporting plate **24**. A spring **66** constrained on the threaded stud **61** between the block **64** and a pair of lock nuts **67** frictionally biases the block toward the right as viewed in FIG. 3 to prevent accidental displacement of the block and to take up lost motion in the threads.

By turning the hand wheel **63**, therefore, the clamp supporting plate **24** and the button gripping jaws **34** and **37** carried thereby will be turned about the shouldered screw **23** as a fulcrum to adjust the position of the button shank transversely across the work supporting bed of the sewing machine with micrometric accuracy.

The button holding clamp of this invention thus provides for an adjustment by means of the lock nut **44** and the arcuate slotted adjusting block **46** to accommodate shank buttons of different size and character, an adjustment by means of the hand wheel **38** for locating the button shank lengthwise of the sewing machine bed relatively to the path of reciprocation of the needle, and an adjustment by means of the hand wheel **63** for locating the button shank transversely of the sewing machine bed relatively to the path of reciprocation of the needle.

The universal adjustments provided by this invention are associated as an integral part of the button clamp which may thus be applied to conventional sewing machines without the necessity for modification of the sewing machine the button clamp of this invention is thus well adapted for use with existing sewing machines.

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

1. A button holding clamp for a sewing machine having a frame, a needle carried for endwise reciprocation vertically in said frame, and a work clamp base shiftably supported on said frame relatively to said needle to produce button securing stitches, said button holding clamp comprising a clamp supporting plate, means adapted to pivotally secure said clamp supporting plate relatively to said sewing machine work clamp base on a vertical axis substantially parallel to the path of reciprocation of said needle, a horizontal shaft journaled in said clamp supporting plate transversely of said pivotal axis, an eccentric portion formed on said shaft, a pair of opposed button gripping jaws each hingedly supported on said eccentric shaft portion, a first hand wheel secured on said shaft at one side of said button gripping jaws for turning said shaft to shift simultaneously the position of both of said button gripping jaws toward and away from the pivotal axis of said clamp supporting plate, and means for shifting the position of said button gripping jaws angularly about the pivotal axis of said clamp supporting plate, said

means including a horizontal threaded stud disposed transversely of the pivotal axis of said clamp supporting plate, means for constraining said stud axially relatively to said sewing machine work clamp base, means threadedly engaging said threaded stud and operatively connected to said clamp supporting plate, and a second hand wheel secured on said threaded stud at the side of said button gripping jaws opposite said first hand wheel for turning said threaded stud to shift said clamp supporting plate angularly about said pivotal axis.

2. A button holding clamp for a sewing machine having a frame, a needle carried for endwise reciprocation vertically in said frame, a work clamp base shiftably supported on said frame relatively to said needle to produce button securing stitches, and a clamp raising and lowering lever arm carried on said frame and biased into clamp lowering position, said button holding clamp comprising a block adapted to be secured to said work clamp base for movement therewith, a clamp supporting plate pivotally secured to said block on an axis substantially parallel to the path of reciprocation of said needle, a horizontal shaft journaled in said clamp supporting plate transversely of said pivotal axis, an eccentric portion formed on said shaft, opposed upper and lower button gripping jaws each hingedly supported on said eccentric shaft portion, means for turning said shaft simultaneously to shift the position of both of said button gripping jaws toward and away from the pivotal axis of said clamp supporting plate. means operatively connecting said upper button gripping jaw with said clamp raising and lowering lever arm, a threaded stud secured substantially vertically in said lower button gripping jaw, said upper button gripping jaw being formed with an aperture slidably embracing said stud, and a stop nut carried on said threaded stud above said upper button gripping jaw providing for a lost motion connection between said upper and lower button gripping jaws when said upper button gripping jaw is influenced by said clamp raising and lowering lever arm, and means for shifting the position of said button gripping jaws angularly about the pivotal axis of said clamp supporting plate, said means including a horizontal threaded stud disposed transversely of the pivotal axis of said clamp supporting plate, means for constraining said stud axially relatively to said block, means threadedly engaging said threaded stud and operatively connected to said clamp supporting plate, and means for turning said threaded stud to shift said clamp supporting plate angularly about said pivotal axis.

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