

Dec. 8, 1936.

J. H. PIKUL ET AL
CUTTER FOR BUTTONHOLE MACHINES

2,063,398

Filed June 11, 1935

2 Sheets-Sheet 1

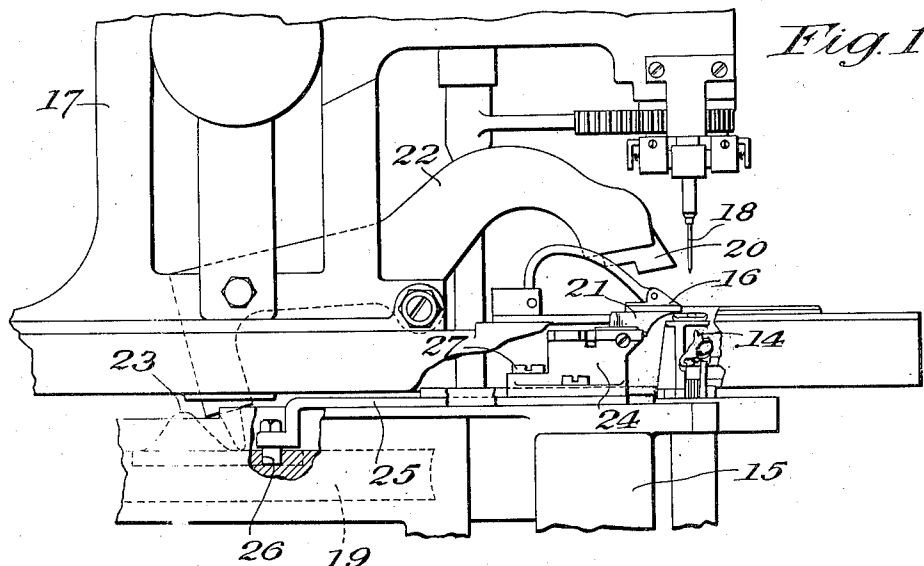


Fig. 1

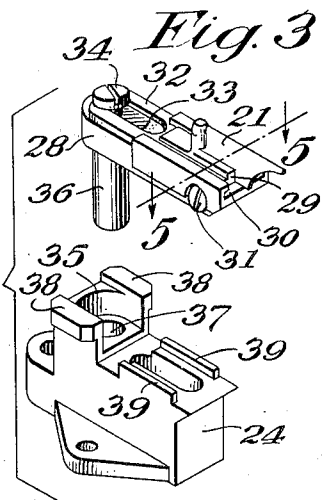


Fig. 3

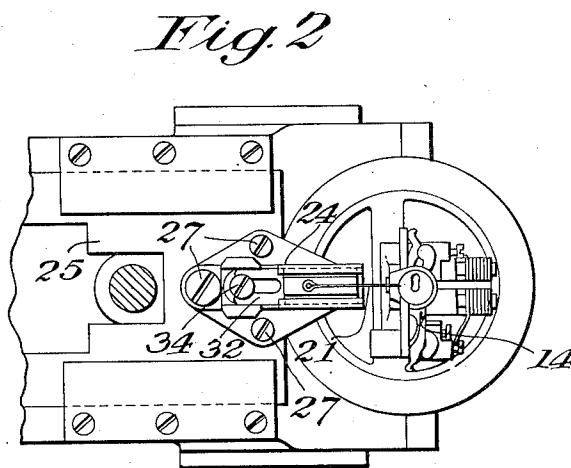


Fig. 2

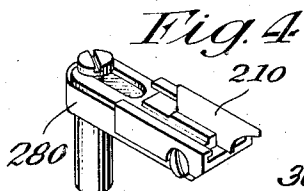


Fig. 4

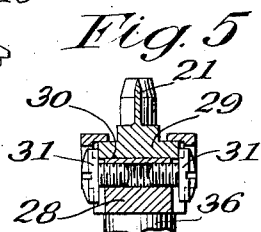


Fig. 5

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Fig. 6

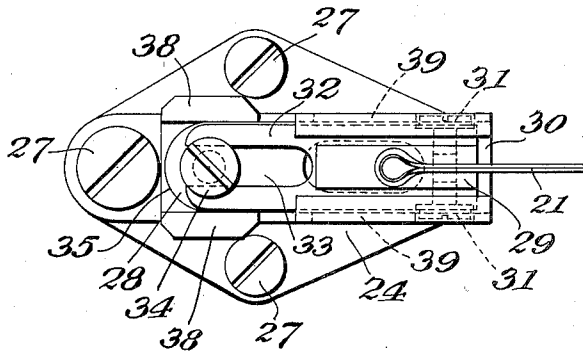


Fig. 7

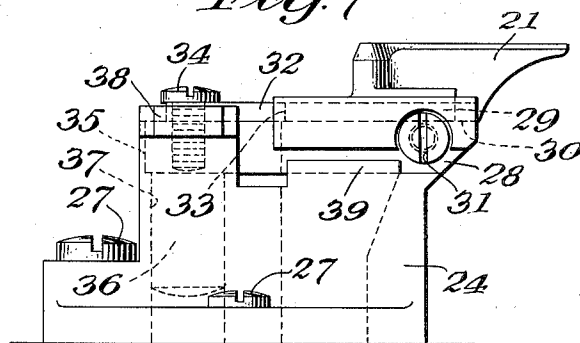


Fig. 9

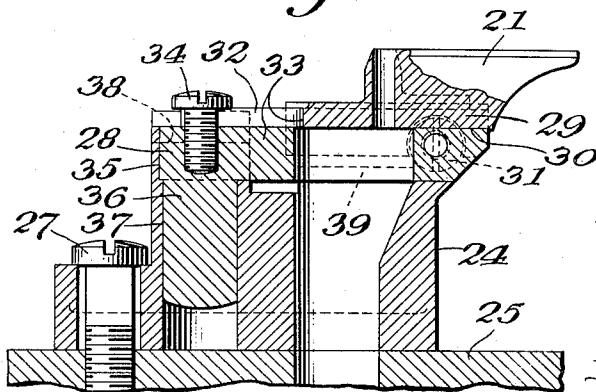
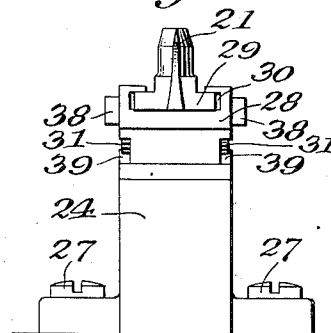


Fig. 8



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UNITED STATES PATENT OFFICE

2,063,398

CUTTER FOR BUTTONHOLE MACHINES

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Application June 11, 1935, Serial No. 25,988

11 Claims. (Cl. 164-2)

This invention relates to buttonhole machines, and especially, although not exclusively, to buttonhole sewing machines in which the buttonhole is first worked or stitched in the fabric and the fabric thereafter cut between the stitches to form the buttonhole slit, and wherein the stitching mechanism is adjustable to sew buttonholes of variable length and either with or without eyes.

In such machines the lines of stitching along the opposite straight sides of the buttonhole are usually located as closely adjacent one another as practically possible in order to avoid the presence of unconfined fabric threads between them. Consequently, the cutter which slits the fabric between these lines of stitching must be very accurately located in order that the fabric may be properly cut without cutting the stitches. The like is true of the portion of the cutter which cuts or punches out the eye, in the case of an eye buttonhole, it being desirable that the fabric be cut as closely as possible to the eye-forming stitches in order to avoid ragged edges resulting from the presence of fabric threads which are not properly confined and bound by the stitching.

In the case of buttonhole machines which are adjustable to form buttonholes of different sizes and shapes, a separate cutter is necessary for each size and shape of buttonhole, making it necessary to change or substitute cutters when shifting from one size or shape to another. While in larger establishments, employing a considerable number of machines, it may be possible to set up several machines for different sizes and shapes of buttonholes, transferring the work from one to the other as occasion may require, in smaller establishments it is desirable to change over a single machine from time to time to adapt it to the formation of different types of buttonholes. This necessitates the changing of cutters, and the proper setting and adjustment of substituted cutters, which is usually done by means of gibs or shims, is a very slow and difficult operation, requiring skill beyond that of the ordinary machine operator, and making it necessary to employ a skilled mechanic to make the substitution and adjustment, thereby, to a large extent, offsetting the advantages of an adjustable machine, especially in the smaller establishments where such machines would otherwise be particularly useful.

The present invention has for its object to overcome the above difficulties and make it possible for the machine operator, without the exercise of any considerable skill, to change cut-

ters quickly and easily as occasion may require, each cutter, as put into operative position in the machine, being automatically located therein with the degree of precision required without special attention on the part of the operator.

The more particular objects of the invention, together with means whereby the latter may be carried into effect, will best be understood from the following description of a preferred embodiment thereof illustrated in the accompanying drawings, this embodiment, however, being chosen for purposes of exemplification merely, as it will be obvious to those skilled in the art that the invention, as defined by the claims hereunto appended, may be otherwise embodied without departure from the spirit and scope thereof.

In said drawings:

Fig. 1 is a side elevation, partly broken away, of a portion of a buttonhole machine having a cutter mounting embodying the invention;

Fig. 2 is a plan view of certain of the parts shown in Fig. 1;

Fig. 3 is a detail perspective view of the cutter support and carrier, showing these parts separated, and showing the carrier provided with a cutter suitable for cutting an eye buttonhole;

Fig. 4 is a similar view of the carrier, showing the same provided with a cutter suitable for cutting a straight or no-eye buttonhole,

Fig. 5 is a section taken substantially on the line 5-5, Fig. 3;

Figs. 6 to 9 are enlarged views of the complete cutter mounting; Fig. 6 being a plan view, Fig. 7 a side elevation, Fig. 8 a front elevation, and Fig. 9 a longitudinal section.

While by no means limited to any specific type of buttonhole machine, the invention is illustrated in Figs. 1 and 2 as applied to a buttonhole sewing machine of the type described in the patent to Connors, No. 1,844,462, February 9, 1932. Such a machine comprises a bed frame 15 upon which the work is clamped by the usual work-clamp 16, and a sewing head 17 carrying the stitch-forming mechanism including a needle 18 and a cooperating looper 14, which head is movable with respect to the work, to position the stitches, under the control of a main cam 19. In accordance with the arrangement shown in said Connors patent, the cutting instrumentalities include a cutting block 20 and a cutter 21, the former being carried by a lever 22 operated by a suitable portion 23 of the main cam 19, while the latter is mounted on a support 24 secured, as by bolts 27, to a slide 25 operated by a

groove 26 in the cam 19 to move said cutter into and out of operative position.

In accordance with the present invention, the cutter 21 is detachably and adjustably mounted in a carrier 23 which in turn is removably received, in a fixed predetermined position, in the support 24. The cutter 21 is formed with an extended or T-shaped base 29 which is received in an under-cut way 30 in the carrier 28, said base being longitudinally adjustable in said way, and said way being somewhat wider than said base to permit lateral adjustment of the cutter therein. Said lateral adjustment is effected and fixed by adjusting screws 31 in threaded engagement with the carrier 28 and having heads embracing the lateral edges of the base 29. The cutter 21 is further formed with a shank 32 having a longitudinal slot 33 through which passes a clamp screw 34 in threaded engagement with the carrier. It will thus be seen that, by operating the screws 31, the cutter 21 can be laterally adjusted in the carrier, while by means of the clamp screw 34, said cutter may be securely clamped to the carrier in a predetermined longitudinal position with respect thereto.

The rear end of the carrier 23 is received in a suitably formed socket 35 in the support 24, and said carrier is formed with a projection 36 which is received in an opening 37 in said support communicating with said socket. The fit of the projection 36 in the opening 37 is a snug one, that is to say, substantially the equivalent of a close running fit which permits the ready removal of the carrier while preventing any looseness or lost motion between said projection and opening. The support 24 is formed with lugs or projections 38 and 39 whose inner surfaces similarly snugly embrace portions of the sides of the carrier. Consequently, while the carrier 23 may be readily inserted into or removed from the support 24, when placed therein said carrier will be accurately located in a fixed predetermined position in said support.

It will therefore be seen that, by providing a series of similar and interchangeable carriers, equal in number to the series of cutters which are to be used in a given machine, each of said carriers may be provided with a cutter whose position therein can be accurately adjusted once for all and need not thereafter be changed. Thus, in Fig. 3 is shown a carrier 28 having a cutter 21 suitable for cutting an eye buttonhole, while in Fig. 4 is shown an identical carrier 280 provided with a cutter 210 suitable for cutting a straight or non-eye buttonhole. It will be obvious that cutters suitable for both eye and non-eye buttonholes of a wide variety of lengths can be provided and mounted in properly adjusted positions in their respective carriers, the adjusting screws 31 and clamp screw 34 affording convenient means for effecting such adjustment. After such a series of carriers with their respective cutters suitably positioned therein has been provided, the machine operator, in changing from one type of buttonhole to another need only remove one carrier and substitute another, with minimum trouble and without the exercise of any special skill, since each carrier, when placed in the support, is automatically located in a fixed predetermined position, thereby accurately locating its cutter in proper position in the machine.

We claim:

1. In a buttonhole machine, a buttonhole cutter, a carrier in which said cutter is adjustably

mounted, and a support in which said carrier is removably received, said carrier and support having interengaging means for accurately locating said carrier in a fixed predetermined position in said support when inserted therein.

2. In a buttonhole machine, a buttonhole cutter, a carrier in which said cutter is detachably mounted for adjustment both laterally and longitudinally, and a support in which said carrier is removably received, said carrier and support having interengaging means for accurately locating said carrier in a fixed predetermined position in said support when inserted therein.

3. In a buttonhole machine, a buttonhole cutter, a carrier therefor, means for securing said cutter to said carrier in a variable but normally fixed longitudinal position, adjusting devices for fixing the lateral position of said cutter in said carrier, and a support in which said carrier is removably received, said carrier and support having interengaging means for accurately locating said carrier in a fixed predetermined position in said support when inserted therein.

4. In a buttonhole machine, a buttonhole cutter having an extended base, a carrier for said cutter having an undercut way in which said base is received for lateral and longitudinal adjustment, devices for fixing the lateral and longitudinal position of said base in said way, and a support in which said carrier is removably received, said carrier and support having interengaging means for accurately locating said carrier in a fixed predetermined position in said support when inserted therein.

5. In a buttonhole machine, a buttonhole cutter having an extended base and a longitudinally slotted shank, a carrier for said cutter having an undercut way in which said base is received for lateral and longitudinal adjustment, adjusting screws for fixing the lateral position of said base in said way, a clamp screw passing through the slot in said shank for securing said cutter to said carrier in a fixed longitudinal position, and a support in which said carrier is removably received, said carrier and support having interengaging means for accurately locating said carrier in a fixed predetermined position in said support when inserted therein.

6. In a buttonhole machine, a buttonhole cutter, a carrier in which said cutter is adjustably mounted, and a support in which said carrier is removably received, said support having surfaces between which said carrier may be freely inserted but which snugly embrace portions of said carrier and thereby predetermine the position of said carrier in said support when inserted therein.

7. In a buttonhole machine, a buttonhole cutter, a carrier in which said cutter is adjustably mounted, said carrier having a projection, and a support having an opening in which said projection is removably but snugly received, said support having also permanently fixed projections snugly embracing said carrier laterally.

8. In a buttonhole machine, a buttonhole cutter, a carrier in which said cutter is accurately positioned, and a support in which said carrier is removably received, said carrier and support having interengaging means for accurately locating said carrier in a fixed predetermined position in said support when inserted therein.

9. In a buttonhole machine, a buttonhole cutter having a base and a longitudinally slotted shank, a member to which said cutter is secured

having a way to receive said base and permit movement thereof laterally and longitudinally, adjusting screws in threaded engagement with said member and having heads embracing said base, and a clamp screw passing through the slot in said shank for securing the cutter to said member.

10. In a buttonhole machine, a buttonhole cutter, a carrier in which said cutter is adjustably mounted, and a support in which said carrier is removably received, said carrier and support having interengaging means whereby insertion of said carrier in said support locates the

former in a fixed predetermined position with respect to the latter.

11. In a buttonhole machine, a buttonhole cutter, a carrier in which said cutter is detachably mounted for adjustment both laterally and longitudinally, and a support in which said carrier is removably received, said carrier and support having interengaging means whereby insertion of said carrier into said support locates the former in a fixed predetermined position with respect to the latter.

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