March 31, 1931. G. W. MAYO ET AL 1,798,890

METHOD OF MAKING LATCH NEEDLES

Filed May 20, 1927

Fig. 1.

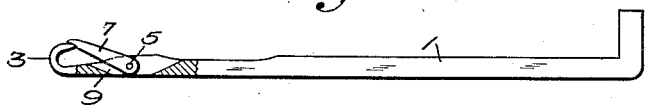


Fig. 2.

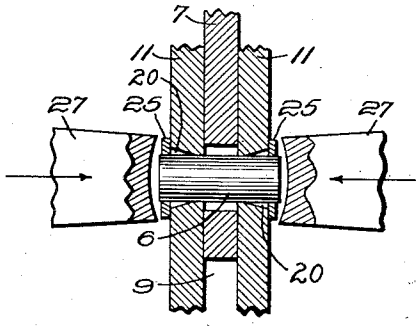


Fig. 3.

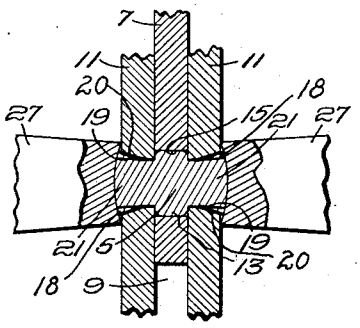
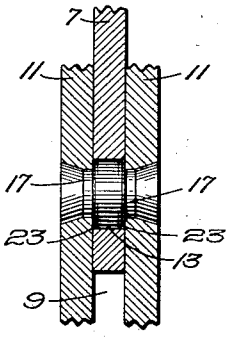


Fig. 4.



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UNITED STATES PATENT OFFICE

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METHOD OF MAKING LATCH NEEDLES

Application filed May 20, 1927. Serial No. 192,883.

This invention aims to provide an improved method of making latch knitting machine needles.

In the accompanying drawings is shown an illustrative embodiment of the invention, wherein:

Fig. 1 is a side elevation of a needle produced by the method herein described with portions surrounding the latch pivot shown in section;

Fig. 2 is an enlarged sectional view taken longitudinally through the pivot and immediate portions of the latch and needle body and illustrating a step in the operation of attaching the latch to the needle;

Fig. 3 is a similar section showing a more advanced step in the process; and

Fig. 4 shows in section the pivot in its substantially completed state.

In the particular embodiment of our invention selected for purposes of illustration and shown in the drawings, one form of needle produced thereby comprises a body 1 having the usual hook 3 at one end adjacent to which is pivoted at 5 a latch 7 which operates at times to close said hook for the purpose of casting off a loop that has previously been formed upon the needle. The latch 7 is pivoted to the needle body 1 within a slot 9 extending longitudinally of said body, said slot providing thin supporting members 11 on opposite sides of the latch.

In its final state the pivot pin 5 desirably has an enlarged central journal portion 13 which loosely fits a relatively large perforation 15 in the latch 7, thereby permitting the latch to turn freely thereon, while the end portions 17 of said pivot pin, which are smaller in diameter than the body 5, occupy relatively smaller perforations 19 formed in the side portions 11 of the needle body. The smaller portions 17 are brazed to the side members 11 so as to prevent any likelihood of looseness occurring between the pivot and the needle body which would eventually permit the pivot to move longitudinally in the needle body and project slightly at the end to catch upon the fibres of the yarn and so produce a rough appearance in the finished fabric.

Desirably the perforations 19 are outwardly flared or countersunk as shown at 20 and the ends of the pivot pin 5 are headed at 21 to substantially fill said countersunk or outwardly flaring portions and these headed portions are brazed to the needle body.

The enlarged pivot portion 13 provides shoulders 23 which engage the inner adjacent faces of the side portions 11 and assist in preventing longitudinal movements of the pivot pin should by chance the ends of said pin become loosened by wear. Furthermore, by enlarging the bearing portion of the pin which is usually the first part to wear out, the life of the needle will be greatly prolonged.

In order that the needle embodying this invention may quickly and economically be made we provide a method of making the same which includes the insertion or forcing of a pin 6 of substantially uniform diameter throughout, through the aligned perforations 19 of the portions 11 and through the enlarged portion 15 of the latch, the said pin 6 being sufficiently long to protrude slightly beyond opposite ends of the body portion 1 as shown in Fig. 2. A brazing flux of any suitable form or character, but herein shown in the form of washers 25, is placed near or upon the protruding ends of the pin 6.

As shown in Fig. 2 the pin 6 snugly fits the small diameters of the holes 19 and this is desirable in order to prevent the brazing material or solder when subsequently melted from working through into the enlarged perforation 15 of the latch 7 or between the sides 11 of the needle and said latch, thereby preventing the free swinging movements of said latch. It is further apparent that if the insertion of said pivot pin into said apertures does not provide sufficient tightness to prevent the above from taking place, it is within the scope and purpose of this invention to exert pressure upon the ends of said pin in advance of the application of heat thereto so as slightly to compress said pin to cause it fully and tightly to fit said small perforations 19. The melting or brazing action will follow said application of pressure at the proper moment.

A further step in the operation is to apply

heat and pressure to the pivot pin but owing to the relative softness of the flux 25, said flux will first melt and flow into the perforations 19 around the ends of the pin. The metal of the pin 6 will next be softened to such an extent that a relatively slight pressure upon the ends thereof will cause said pin to be upset or enlarged substantially to fill the perforation 15 in the latch as well as the substantial portions of perforations 19 in the side members 11; including the countersunk ends of said perforations. Preferably the last three operations are performed nearly if not substantially simultaneously by the use of instrumentalities, such for example as electrodes of an electric welding machine which when moved into contact with the projecting ends of the rivet will cause an electric current to pass through said pin and effect the heating and softening of the rivet as well as the melting of the soldering or brazing material. The pressure applied by said electrodes to the pin when the latter has become sufficiently heated results in the expanding or upsetting of the pin body to produce the enlargement 13 thereof and likewise the heading of the ends into the countersunk portions of the perforations 19. The invention however is not limited to the use of electricity for heating purposes nor to the use of said electrodes for providing the necessary pressure to upset said pin.

As the ends of the pivot pin expand, under the combined heating and final compressing actions, into the perforations 19 the fused brazing material will form a ring encircling each end of the pivot pin and effect the fusing or brazing of the ends of said pivot pin to the surrounding portions 11 of the needle making a solid permanent union between the two parts, namely the pivot pin and needle body. The operation of heating and compressing the pin 6 will be brought to an end before the enlarging of the journal portion of said pin 6 shall have been carried far enough to cause it to engage too tightly the perforation 15 in the latch so as to leave said latch freely turnable upon said pivot.

Following the completion of the above steps the hardening and final smoothing up and polishing operations will take place.

The invention is not limited to the particular embodiment shown.

Claims:

1. That method of making a latch needle which includes the forming of a slotted needle body with aligned perforations and a latch to fit said slot having a perforation of relatively larger diameter than those of said body, then in inserting a pin through the aligned perforations of said needle body and latch in tightly fitting relation to the inner ends thereof, and in arranging a brazing material near said ends, and then in applying heat and pressure to melt said brazing material to cause it to encircle the ends of said pin, and to soften and compress said pin so as to cause it to enlarge and fill said perforations.

2. That method of making a latch needle which includes the inserting of a pin through perforations in the needle body and latch thereof with the ends of said pin projecting slightly beyond opposite faces of said body and in arranging a brazing flux near said projecting ends, in applying heat to melt said flux and soften said pin and in applying pressure to opposite ends of said pin while in said softened state to cause the pin to expand substantially to fill the perforations in said latch and tightly to fill the perforations of said body and to braze said pin to the walls of said body.

3. That method of making a latch needle which includes the forming of a slotted needle body with aligned outwardly flaring perforations and a latch to fit said slot having a perforation of relatively larger diameter than those of said body, then in inserting a pin through the aligned perforations of said needle body and latch with the ends of said pin protruding slightly beyond opposite outer faces of said needle body, then in placing collars of a brazing flux upon both of said protruding ends and then in applying heat and pressure to opposite ends of said pins first to melt said brazing flux and cause it to flow into the perforations in said body surrounding said pin, then to soften said pin and finally to expand the pin substantially to fill the enlarged perforation of said latch and tightly to fill the perforations of said body and to braze the ends of said pin to said body.

4. That method of making a latch needle which includes the forming of a slotted needle body with aligned outwardly flaring perforations and a latch to fit said slot having a perforation of relatively larger diameter than those of said body, then in inserting a pin through the aligned perforations of said needle body and latch with the ends of said pin projecting slightly beyond opposite faces of said body and in arranging a brazing flux near said projecting ends, and then in forcing electrodes toward each other against opposite ends of said pin to cause said flux to melt and fill the perforations in said needle body surrounding said pin and to soften said pin and finally compress the latter substantially to fill the enlarged perforations in said latch and tightly to fill and braze said needle body and pin together.

5. That method of making latch needles which includes the forming of a slotted body with aligned perforations in the sides thereof and in forming a latch with a perforated end, then in inserting a pivot pin through the aligned holes of said body and latch, and in placing brazing material adjacent the ends

of said pivot pin and then in applying heat to melt said flux, and to soften said rivet, and in applying pressure to expand said rivet body substantially to fill said perforations in said latch and to fuse the ends of said pivot pin to said needle body.

6. That method of making latch needles which includes the forming of a slotted body with aligned perforations in the sides thereof adjacent the slot, the outer ends of said perforations being enlarged, in forming a latch with a perforated end, then in forcing a pivot pin through said aligned perforations in said body and latch in tightly fitting relation to the inner smaller perforations in said body, in providing brazing material for the ends of said pivot pin and then in applying heat and pressure to said pin and said brazing material to soften said pin and to effect the up-setting and brazing of the ends thereof to the surrounding portions of said body, the inner ends of the perforations in said body and said pivot pin forming a relatively tight fit to prevent the melted brazing material from passing into the eye of said latch, and forming around the perforations of said body outwardly tapered rings of brazing material.

In testimony whereof, we have signed our names to this specification.

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DELBERT F. MORSE.