

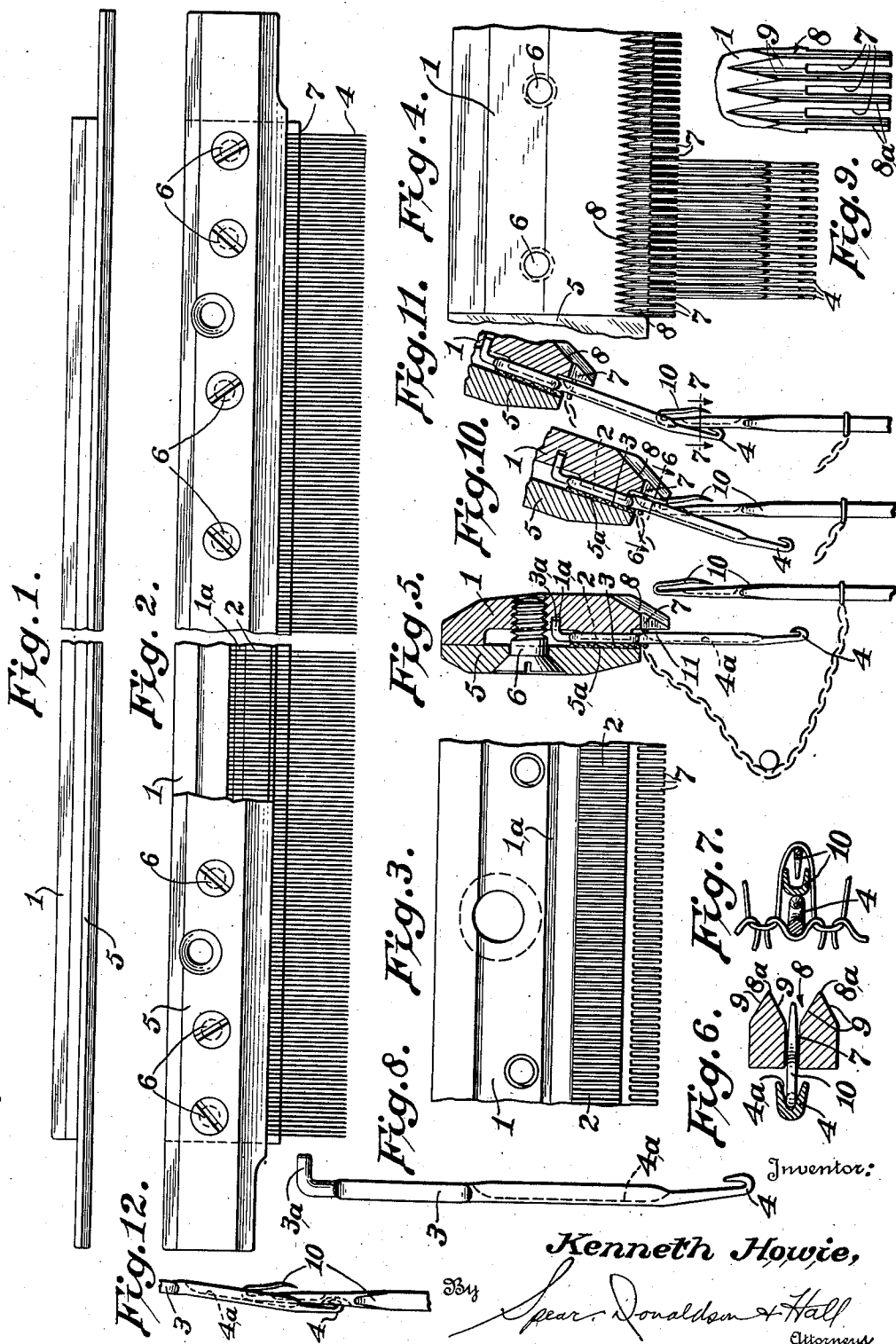
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K. HOWIE

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KNITTING MACHINE

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Kenneth Howie,

Spear, Donaldson & Hall
Attorneys.

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KNITTING MACHINE

Kenneth Howie, Norristown, Pa., assignor to Wildman Mfg. Co., Norristown, Pa., a corporation of Pennsylvania

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12 Claims. (Cl. 66—96)

The invention concerns a bar for turning the welt on a full fashioned knitting machine, and relates particularly to the provision of guiding means on the bar whereby needles which may have become bent, or for other reasons lie out of their proper position, will be so controlled that they will properly cooperate with the welt hooks of said bar for receiving the loops of the first course of the welt.

The invention is shown in the accompanying drawing in which

Figure 1 is a top plan view of a welt turning bar embodying the invention.

Fig. 2 is a front view of the welt bar with its welt hooks. That is to say, this view shows that face of the bar which is towards the front of the knitting machine when the bar has assumed its position adjacent the needles for turning the welt. A part of the bar is broken away to show the upper portions of the stems of the welt hooks which are clamped between the sections of the bar.

Fig. 3 is a front view of the main section of the welt bar, i. e., with the clamping sections and the welt hooks removed.

Fig. 4 is a view of a portion of the welt bar looking at that face which is on the other side of the bar from that shown in Fig. 2.

Fig. 5 is a cross sectional view of the bar with one of its welt hooks shown in elevation, illustrating also one relative position to the needle.

Fig. 6 is a plan view of a section on line 6—6 of Fig. 10.

Fig. 7 is an exaggerated plan view of a section on line 7—7 of Fig. 11.

Fig. 8 is a view of the welt hook.

Fig. 9 is an enlarged view of a detail.

Figs. 10 and 11 are views of relative positions of the welt bar and the needles, assumed during the progress of the operations of turning the welt.

Fig. 12 is a view of a needle having a special eye in its back.

The welt bar comprises a main section 1, grooved on its front side as at 2, Figs. 3 and 5, for receiving the upper portions 3 of the stems of the welt hooks 4.

The welt hooks are held in these grooves, which space them accurately and uniformly apart, by a clamping plate 5, held to the main section 1 of the welt bar by the screws 6. The upper ends of the stems of the welt hooks are bent to provide laterally projecting portions 3a which enter the groove 1a in the front face of the main section of the bar.

A strip of suitable material 5a may be interposed between the stem portions 3 of the welt hooks and the clamping plate 5 to bear directly on the edges of the said stems which project from the grooves 2, to act as a filling piece and insure that the clamping action will be effective on all the stems.

The main section 1 of the bar has its lower edge portion extending to a level some distance below the level of the upper part of the eye 4a of the welt hook, and this edge portion is kerfed or notched at 7 in line with the eyes of the welt hooks. These kerfs or slots 7 are in alignment vertically with the grooves 2 of the main section of the welt bar and hence the eyes of the welt hooks, as just stated, align with the kerfs or slots 7. These kerfs serve as guides leading to the eyes of the welt hooks so that in the manipulation of the welt bar to transfer the loops from the welt hooks back onto the needles 10 these slots will act as guiding means, insuring that the needles will be received in the eyes of the welt hooks. Communicating with these guiding kerfs or slots 7 are flaring notches or spaces 8 formed by outwardly diverging flat faces or walls 9 forming angularly disposed guiding extensions of the walls of the kerfs or slots terminating in comparatively sharp edges 8a. These diverging walls form guides insuring that the needles, despite any misalignment thereof, due to said needles becoming bent or distorted for any reason, will be received by the slots or kerfs 7 and guided thence to the eyes of the welt hooks, and thus proper relation between the welt hooks and the needles will be set up, notwithstanding initial misalignment. This will insure the placing of the loops of the initial course of the loops back onto the needles in the subsequent operation.

The flaring of the guiding walls 9 in respect to the guiding slots 7 is sufficient to provide amply wide spaces 8, virtually constituting wide mouths for the guiding slots 7, so as to engage any needles misaligned to a maximum degree.

The welt bar may be given the necessary movements in replacing the loops back onto the needles by hand or with the aid of a carrier of the general type shown in Letters Patent of the United States granted to me March 31, 1936, No. 2,036,143, or in any other way, my said invention concerning mainly the structure of the bar whereby misaligned needles will be received by the bar and directed in prescribed relation to the welt hooks for the welt turning operation, however it may be performed.

It will be noted that the clamping plate at

what may be termed the front of the bar is of considerably less depth vertically than the depth of the main part of the bar so that the slots or kerfs which guide the needles are below the level of the lower end of said clamping plate. Further, it will be seen that clearance exists at 11 between the stem of the welt hook and the depending slotted or needle guiding lower edge portion of the main section of the bar. As a result of these two features, i. e., (1) the free space at the back of the upper part of the stem, adjacent the lower edge of the clamping plate due to the less depth vertically of said plate, and (2) the clearance at 11, it results that the loop on the stem of the welt hook will assume a position close to the lower edge of the clamping plate and close to the level of the upper wall of the needle guiding slots so that the said slots will be free to receive the upper ends of the needles for aligning the same with the eyes of the welt hooks, and below the plane occupied by the loops on the stems of said hooks, ready to receive said loops when they are pressed down by hand in the final act of transfer.

The forms disclosed are illustrative of the invention and not restrictive upon its scope, which is defined by the appended claims.

It will be noticed that the lower portion of the bar is tapered downwardly in cross section. The kerfs or notches are formed in this tapered part of the bar. This is true also of the flaring mouths communicating with said notches 7, and these flaring mouths lie in part in the same general horizontal plane with the notches, and extend above the level of the notches.

In cutting or milling the bottom of the welt bar, the transverse slots or kerfs 7 are first cut and then the flaring mouths 8 are cut, and for cheapness and convenience these mouth spaces 8 are run on through the body metal to the outer face of the bar, although they might be formed in some other manner.

The welt bar is moved up to bring the hooks to the proper position for getting the hook back of the needle for shielding the point of the hook in passing the loops onto the needle stem at the eye portion thereof, which is the widest part of the needle. The length of the hooks illustrated are necessary in order that the bar itself will clear the noses of the sinkers in their full out positions, in hooking up the first course of knitting.

It will be noticed that the width of the guide notches or kerfs is such that the needle head will be guided with certainty to the eye of the welt hook though the entrances to said notches are considerably wider than the notches so as to insure receiving of the needle heads even though the needle be misaligned in respect to the guiding portion of the notch of comparatively slight width.

In Figure 12 I show a needle having a special eye in its back edge so that the hook end of the point can bury itself therein. This special eye is formed in a plane just below that of the regular eye on the front side of the needle which receives the lower end of the beard as in ordinary practice. This needle per se is not claimed herein, but has been made the subject matter of an application filed by me on August 23, 1938, Serial No. 226,365.

In machines of coarse gauges the width of the needle is enough to shield the end of the hook of the transfer point, but in machines of the finer gauges the special eye desirably may be used to

insure the shielding of the hook of the transfer point.

I claim:

1. A welt bar having welt hooks with eyes terminating adjacent the lower edge of the bar, said bar having notches, leading to the eyes of the welt hook, defined by parallel walls with guide walls diverging from each other outwardly of the bar, and forming continuations of the said parallel walls providing outwardly flaring recesses for receiving the needle ends and guiding them to the eyes of the welt hooks.

2. A welt bar having a section for carrying the welt hooks, provided with grooves for receiving the stems of said hooks, notches in its lower edge in the same vertical planes with said grooves and adapted to receive and guide the needles, welt hooks seated in said grooves having eyes opposite the said needle guiding notches, and flaring mouths to said notches for guiding the needles thereto, and means for clamping the stems of the welt hooks in the grooves of the bar, substantially as described.

3. A welt bar having welt hooks, the lower edge of said bar being notched to provide guideways receiving the needles to insure engagement of the eyes of the hooks and the needles, and a flaring guideway for the needle associated with each notch, the lower part of the bar being inclined downwardly and inwardly and the flaring guideway lying partly in the same horizontal plane with the notches and partly above the plane of the notches.

4. A welt turning bar having a main section, the lower edge of which is provided with guide notches having flaring mouths for receiving and directing the needles, welt hooks, a clamping plate holding the welt hooks to the main section, and terminating at its lower edge in a plane leaving free space for receiving loops, the notches being free for receiving the needle ends and directing them into the eyes of the hooks, substantially as described.

5. A welt bar according to claim 4 in which clearance is provided between the stems of the welt hooks and the notched lower edge of the main section of the bar for allowing the loops to be located in elevated position in respect to the guiding notches, substantially as described.

6. A welt bar for full fashioned knitting machines having welt hooks provided each with an eye in its stem on the hook side thereof, said hook being adapted to lie on the beardless side of the needle to be shielded by the stem of the needle against engagement with the yarn in transferring the loops back onto the needle, guiding means on the bar for directing the heads of the needles to the eyes in the stems of the hooks consisting of notches in the lower edge of the bar having entrances of greater width than the main guiding portion of said notches, said welt hook stems having clearance about their upper ends for allowing location of the loops of the initial course above the level of the upper ends of the needles guided by said notches, substantially as described.

7. A welt bar having guides receiving the needles and insuring their engagement with the welt hooks for the turning of the welt, said guides consisting of kerfs in the lower edge of the bar in alignment with the eyes of the welt hooks.

8. A welt bar having guides receiving the needles and insuring their engagement with the welt hooks for the turning of the welt, said guides consisting of kerfs in the lower edge of the bar

with guides walls in convergent relation to the walls of said kerfs.

5 9. In combination, spring beard needles and a welt bar having welt hooks which cooperate with the side of the needles opposite from the spring beard to deliver welt loops to the needles, said needles each having an eye in said opposite side to receive the hooked end of the welt hook.

10 10. The combination according to claim 9 in which said eye is below the eye in the beard side of the needle.

11. A welt bar having fixed stationarily thereto welt hooks having eyes to receive the ends of the needles, said bar having guides, one for each of

the welt hooks, in line with the eyes of the welt hooks to receive the needles prior to their contact with the welt hooks, and to guide the needles to the eyes thereof.

12. A welt bar having welt hooks fixed stationarily thereto and having guides, one for each of the welt hooks, along the welt bar near the point where the welt hooks project therefrom to receive the needles prior to contact of the needles with the hooks, said guides being in line with the welt hooks to direct the needles to the welt hooks and thereby insure their engagement with the welt hooks for the turning of the welt.

KENNETH HOWIE.