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LINK FOR KNITTING MACHINE CHAINS

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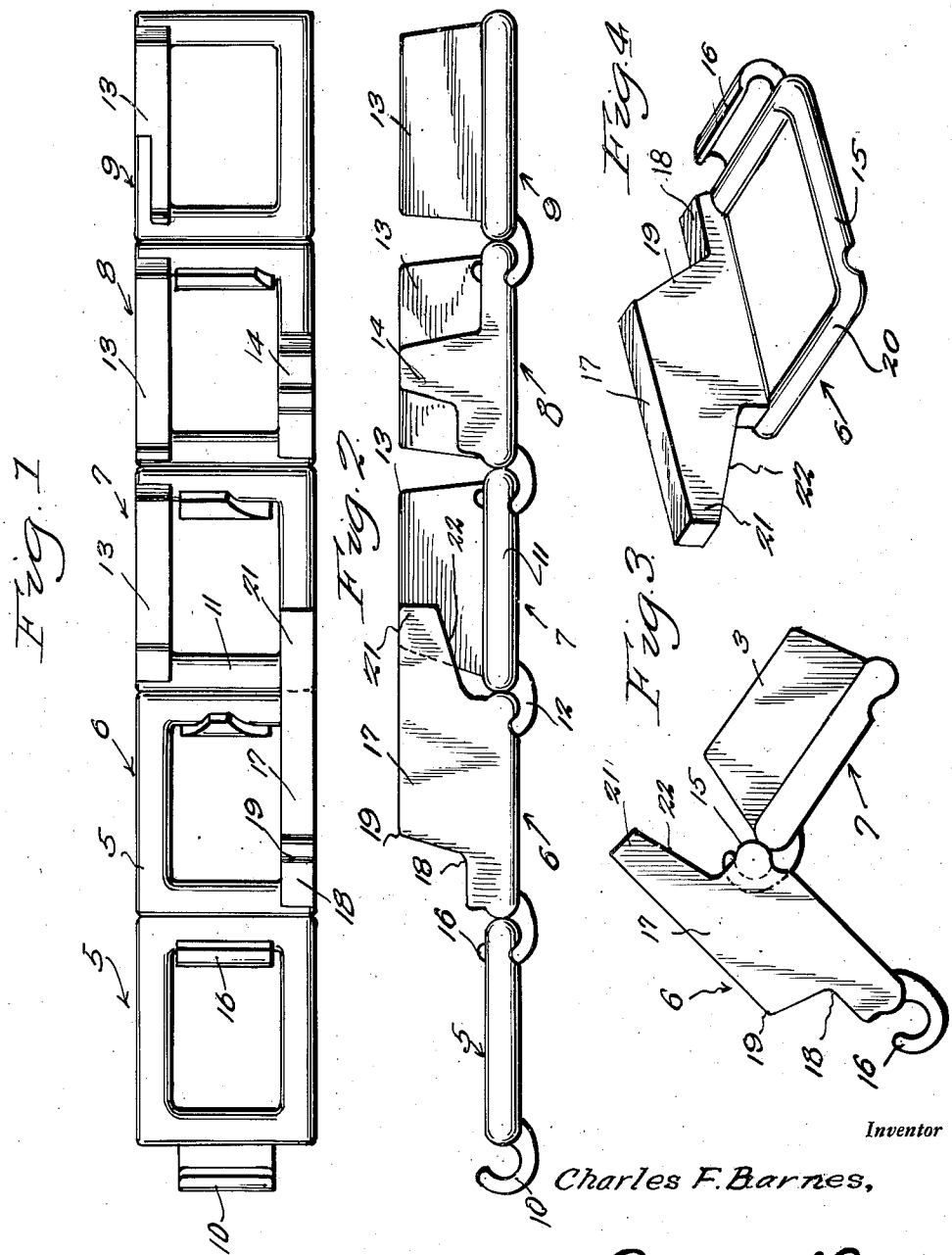


Fig. 1

Fig. 2

Fig. 4

Fig. 3

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LINK FOR KNITTING MACHINE CHAINS

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3 Claims. (Cl. 66—156)

This invention relates to an improved chain such as is adapted for use on automatic knitting machines employed in hosiery mills, for example, the type of chain used in knitting men's half-hose and stockings on a Scott and Williams two hundred needle cylinder form machine, and has more particular reference to an improved special link for incorporation in the chain, which link is possessed of resultful accomplishments.

In carrying out the principles of the instant invention, using the same or conventional chain, less three full links and incorporating therein two improved links, that is, links perfected in accordance with my idea, it becomes possible with the same equipment, that is standard equipment, to turn out more stockings and to, at the same time, conserve the use of carded cotton yarn.

Another object has to do with an improved chain link which is such as to make it possible to take four full courses out of each top, whereas with the present link and the chain arrangement, the operator cannot take out less than a full link or twelve full courses.

Another object of the invention has to do with the adoption and use of an especially designed and improved chain link for knitting machines which appreciably reduces needless idling.

Another object of the invention is the provision of an improved chain link which properly protects and shields the needles in a manner to be hereinafter set forth.

Other features and advantages will become more readily apparent from the following description and accompanying illustrative drawing.

In the drawing, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a top plan view of a portion of a knitting machine chain having the improved especially fashioned and designed extra production link embodied therein.

Figure 2 is a side elevational view of the link assembly seen in Figure 1.

Figure 3 is a side view showing the improved link in the next adjacent stock or standard link with which it is here connected.

Figure 4 is a perspective view of the improved link per se.

Referring now to the drawing by distinguishing reference numerals, it will be seen that the series of five links shown comprise links 5, 6, 7, 8 and 9. The link 5 is a plain rectangular conventional element and has the customary interconnecting and hinging hook 10 at one end. The link 7 (we will skip the improved link 6 for the moment) comprises the usual stock structure, that is, the link proper 11 having a hook 12 and a longitudinal upstanding full length flange 13 on one side. The next adjacent link 8 is characterized by a flange 13 on one side, which corresponds to the flange on the link 7, and an upstanding tooth 14 on the opposite side. The link 9 has a flange 13 and corresponds to the link 7, all of said links being hooked together, as is customary.

Referring now to Figure 4 which details the improved link 6, it will be seen that it is characterized by the usual rectangular frame 15 having a hook 16 at one end. The main part is the integral upstanding flange 17 whose main or body area is of a height corresponding to the height of the flanges 13 on the other links 7, 8 and 9. However, one end is notched to provide a horizontal step 18 and a substantially forty-five degree angular declivity or inclined edge 19. The left-hand end of the flange 17 projects well beyond the adjacent end 20 of the link 15 proper. This provides an over-hanging extension or lug 21 whose under side is beveled inwardly and downwardly toward said part 20, as indicated at the point 22. This over-hanging lug coacts with the non-flanged side of the next or adjacent link 7.

In practice, the improved link 6 is interposed between a plain link 5 and a single-flanged link 7, the latter having its flange 13 on a side opposite to the improved flange 17 on the improved link 6. There are no flanges on the link 5.

It is important to consider the fact that this link 6 is both a cutout link and a make-up link combined. Heretofore the style of chain under consideration has been using two links for these purposes, one link of the "cutout" and one link for the "make-up." With a drop-off between the cutout link and the make-up link, and a space between the two links equal to twelve revolutions the machine must turn after it cuts out the stocking before it can start on the make-up of the next stocking, the machine is running empty (or idling). Link #6 displaces both the old cutout link and the old make-up link, thereby eliminating one full link from the chain. This is equal to twelve revolutions of the machine.

The notch (18 and 19) is so formed to allow the machine to make the same looper clip as before and this is essential to the morale and production of looping machine operators. The surface 18 is so cut as to allow the chain pawl plate to rise thereon and come snug against surface 19 so that on the next stroke of the chain pawl, the chain pawl plate can start from 18 and climb surface 19 and come to rest on top of the link. This is where the machine gets the cutout kick. As there is no drop off between the cutout kick and the make-up kick, the first half of the make-up kick comes on the center top surface of the link, and the last half comes on the top and end of the flange 21. From the top of surface 19 to the end of flange 21 is a distance representing three full strokes of the chain pawl, which is required to accomplish the cutout kick and the

make-up kick. As there is no drop off between the cutout kick and the first half of the make-up kick, extension 21 is required to get the second half of the make-up kick as this must come immediately after the first half. Surface 22 is so designed that when the chain makes the inside turn on the center chain sprocket wheel, said surface 22 will not come in contact with surface frame 11 on link 7 in Figure 2, thereby causing the chain to bind and in most cases to stall. This can readily be seen by reversing the links in Figure 3 so that they turn inward instead of outward.

The four courses of top yarn saving comes about in this manner. The old make-up link would appear as link #6 if extension 21 were struck off even or in a plane with surface 20 in Figure 4, thereby dropping in the top yarn on the back of the link. But by combining both, the cutout link and the make-up link in the one improved link #6, I drop the top yarn in on the extreme end of flange 21 (which is four turns of the machine later), thereby eliminating four courses of top yarn.

To explain further the production increase, by combining the old style cutout and make-up links into the one double purpose link #6, I have completely eliminated one full link from each chain, and by having no drop off between the cutout kick, and the make-up kick, I have reduced the idling time from twelve revolutions to four revolutions. As the idling is done on slow speed, this also reduces the time that the machine must stay on slow speed, and allows the machine to change to high speed eight revolutions much more quickly.

To make a man's half-hose on a Scott & Williams 200 needle, 3½ inch cylinder, H. H. automatic knitting machine running at 195 R. P. M. with the chain and links now being used, there is involved a chain characterized by 12 links in top, 12 links in leg, 13 links in heel, 14 links in foot, and 15 links in toe (2 links in looper clip). This covers a total of 222 punches to each stocking, or a total of 888 revolutions for each stocking, making 100 stockings in seven hours, 39½ minutes, using 14 ounces, and $^{6}/_{100}$ of an ounce in the tops of 100 stockings making the tops out of 18/1 carded cotton yarn.

To make this same stocking on the same machine running at the same speed, using the same chain, less three full links, plus a pair of improved links 6, the same machine will turn out 102 stockings in seven hours and 39½ minutes and one full top on the 103rd stocking. This makes a full gain of two stockings and a full top on the 103rd stocking, and consumes 70/100 of an ounce less yarn in the 103 tops. A chain employing my improvement cuts out four full courses of yarn in each top.

With two of these improved links, I can take four full courses out of each top. With the present chain and links, we cannot take out less than a full link or twelve full courses.

These improved links also protect the needles by allowing the machine to take in, or use yarn on eight revolutions instead of twelve revolutions in making a full stocking.

Finally, my improved link is adaptable to and can be used on any knitting machine, using the same size chain regardless of size of cylinder or the number of needles.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Minor changes in the shape, size and arrangement of details coming within the field of invention claimed may be resorted to in actual practice, if desired.

I claim:

1. In a chain link assemblage of the class described, this for incorporation in a knitting chain applicable to automatic knitting machines, a group of five links, each link embodying a substantially rectangular frame and said frames being provided at proper ends with hooks for hingedly and detachably connecting the respective frames of all of the links together, the link at one end being plain and without flanges, the link at the opposite end being provided on one side with a flange, the next adjacent link being provided with a flange in alignment with the first-named flange, this on one side, and a toothed flange parallel to the companion flange, this on the other side, the next inner link being provided with a flange on the same side as the previous link, and a fifth link interposed between the first-named link and the last-named link and comprising a frame, this provided on one side with an upstanding vertical flange, this flange being on that side opposite to the flanges on the several flanged links referred to, and having an extension providing a lug and said lug over-hanging and being normally spaced from the body of the next adjacent link.

2. In a knitting machine chain of the class described, a plain hook-equipped link, a second link also hook-equipped and provided on one side with a substantially rectangular flange of a length commensurate with the length of the link, and a third link interposed between and hingedly and detachably connected with the first-named links, this being provided with a vertical flange, the flange being located on a longitudinal side opposite to that provided on said second-named link, and the flange on said third link being provided with an extending lug, the lug overlying, in spaced relation, an adjacent portion of the second-named link.

3. As component parts of a knitting machine chain of the class described, a pair of links, each link including a rectangular frame portion of conventional form provided with a customary interconnecting and hinging hook, one of said links being provided on one side with a right-angularly disposed integral flange, said flange being of a length commensurate with the frame, the second link being provided with a flange and said flange being on a side opposite to the side on which the first-named flange is mounted, said flanges being in spaced parallelism to each other, the flange on the second-named link being notched to provide a stepped formation at one end, the opposite end being provided with an extension and said extension being such as to project beyond the adjacent end member of the frame over the longitudinal side member of the frame of the first-named link.

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