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Kamp

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[54] **FORMED SINKER IN WARP KNITTING MACHINES WITH DEVICES FOR HANDLING LONG WEFTS**

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[52] **U.S. Cl.** ..... **66/86 M;** 66/86 R

[51] **Int. Cl.**[2] **D04B 23/00;** D04B 27/00

[58] **Field of Search** ..... 66/86 R, 109, 86 B, 86 M

[56] **References Cited**

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[57] **ABSTRACT**

In a warp knitting machine with devices for handling long weft threads and for feeding the threads to knitting tools of the machine and a guide bar carrying a plurality of eye needles having elongated shanks, at least one formed sinker carried by the guide bar and including a pair of tongue-like support members extending at predetermined mutual spacing substantially parallel to one another and substantially perpendicularly to the shank of at least one of the eye needles of the guide bar so as to support thereon weft threads fed to and extending along the knitting tools.

3 Claims, 4 Drawing Figures

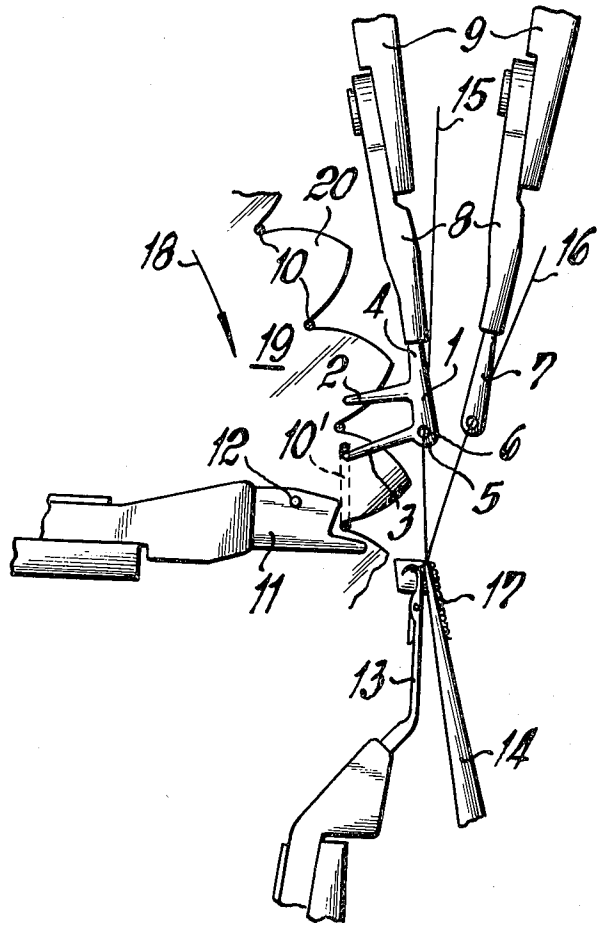


FIG. 1

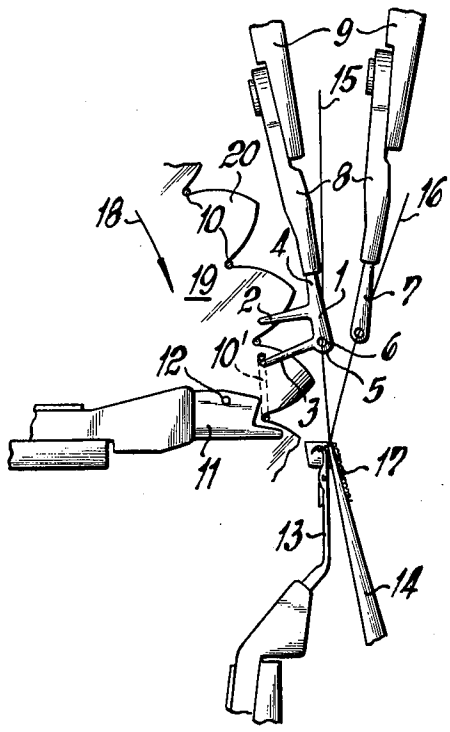


FIG. 2

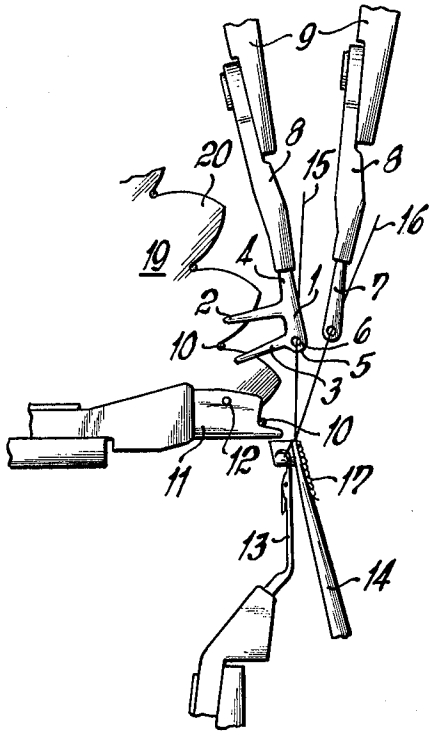


FIG. 4

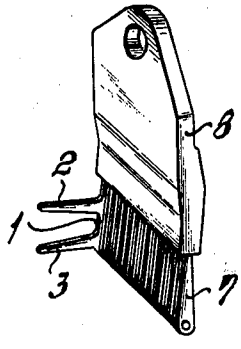
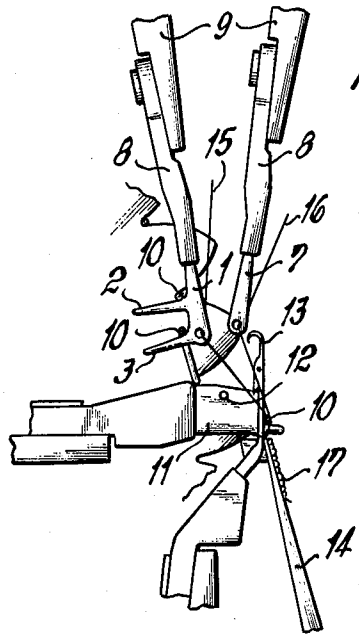


FIG. 3



FORMED SINKER IN WARP KNITTING MACHINES WITH DEVICES FOR HANDLING LONG WEFTS

The invention relates to a formed sinker in warp knitting machines with devices for handling long wefts.

In warp knitting machines with devices for handling long wefts, the weft threads which are often drawn out over very great widths of material must be transferred at high knitting speeds continuously and with the greatest possible reliability, to the knitting tools for intermeshing. The reliability with which the threads are inserted is reduced considerably when the weft threads sag and, for example, two or more intertwined lengths of weft threads are presented.

To prevent the weft threads from sagging, it has been proposed heretofore to support them at half length or even at shorter spacings within the feeding device, the so-called weft thread storage, which is located in the vicinity of the knitting zone proper. Such supports require a by-no-means inconsiderable expense with respect to the placement and accommodation thereof to the plane of feed of the bunch of weft threads and, furthermore, such support cannot extend all the way to the working area of the knitting tools and become effective there.

It is accordingly an object of the invention to provide a formed sinker in warp knitting machines with devices for handling long wefts which avoids the aforedescribed shortcomings of the heretofore known devices of this general type and to provide a support for weft threads which is especially efficiently and universally applicable at very low cost.

With the foregoing and other objects in view, there is provided, in accordance with the invention, in a warp knitting machine with devices for handling long weft threads and for feeding the threads to knitting tools of the machine and a guide bar carrying a plurality of eye needles having elongated shanks, at least one formed sinker carried by the guide bar and comprising a pair of tongue-like support members extending at predetermined mutual spacing substantially parallel to one another and substantially perpendicularly to the shank of at least one of the eye needles of the guide bar so as to support thereon weft threads fed to and extending along the knitting tools.

The tongue-like support members of such a formed sinker can swing, with the motion of the guide bar, into the separated gaps of a weft thread storage device which, for example, stores and feeds in the weft threads on a circular path and between them automatically effect a dimensionally accurate separation of one weft thread from the other. Simultaneously, the separated and supported weft threads are kept away from the weft thread that is to be intermeshed with the warp threads, so that the latter weft thread is seized by the comb, distinctly separated from the supported weft threads, and can be brought behind the knitting needles. When the guide bar and, accordingly, also the formed sinker swing outwardly, the weft thread which is next to be interknitted, is transferred only at the last moment from the lowest tongue-like support member to the comb which is again swinging back.

The formed sinker according to the invention can be secured as a simple punched-out part without difficulty in the guide bar. However, it is particularly advantageous to provide the formed sinker, in accordance with another feature of the invention, with the shank, head and eye of an eye needle. In this manner, the formed sinker according to the invention simultaneously performs the function of an eye needle and can be accommodated in the guide bar without varying the spacing within the row of eye needles. Particularly advantageously, in accordance with the further feature of the invention, the formed sinker forms part of an otherwise conventional needle block equipped with a multiplicity of eye needles. Depending on the length and weight or specific gravity of the weft threads, it may be necessary to provide not only one but several points of support for the weft threads. This can be accomplished in an especially simple manner by mounting within one guide bar several needle blocks equipped with formed sinkers constructed in accordance with the invention.

Other features which are considered as characteristic for the invention are set forth in the appended claims.

Although the invention is illustrated and described herein as formed sinker in warp knitting machines with devices for handling long wefts, it is nevertheless not intended to be limited to the details shown, since various modifications may be made therein without departing from the spirit of the invention and within the scope and range of equivalents of the claims.

The invention, however, together with additional objects and advantages thereof will be best understood from the following description when read in connection with the accompanying drawing, in which:

FIGS. **1** to **3** are diagrammatic views of the knitting tools of a warp knitting machine with the formed sinker according to the invention and part of a weft thread storage device in different phases of operation thereof; and

FIG. **4** is a perspective view of a needle block with a formed sinker according to the invention cast therein.

Referring now to the drawing and first, particularly, to FIG. **1** thereof, there is shown a formed sinker **1**, according to the invention, with tongue-like support members **2** and **3**. In the illustrated embodiment, the formed sinker **1**, in addition to providing a supporting function for the weft threads, as described hereinafter, also provides the conventional function of a normal eye needle such as that shown at **7**, and is equipped for this purpose with a shank **4**, a head **5** and an eye **6**. The formed sinker **1** and the eye needles **7** are cast in needle block **8** which are threadedly secured to guide bars **9** in a conventional manner. Additionally shown in FIG. **1**, is a conventional comb **11** with its latch tuck wire **12**. Below the guide bars **9**, additional knitting tools, the latch needles **13** and the knocking-over bar **14**, are located. The warp threads **15** and **16** intermesh with the weft threads **10** in a conventional manner, and the knitted web or fabric **17** thereby produced, only a short portion of which is shown in FIG. **1**, is withdrawn over the back of the knocking-over bar. The formed sinker **1** of the invention can be used for warp knitting machines with the greatest variety of devices for handling long wefts; therefore no specific device of that type is illustrated. Only part of one of the two storage discs **19** having several holding members **20** with weft threads **10** looped around them and which are located in the vicinity of the edges of the web of material and form part of a heretofore known storage device which transports the weft threads **10** toward the knitting tools in direction of the arrow **18**, is shown.

FIG. 1, furthermore, shows the formed sinker of the invention, in a position thereof wherein a theretofore supported weft thread 10 has just slid off the tongue-like support member 3 and can be seized by the comb 11. The displacement of the weft thread from the position 10' as shown in phantom, should make this particularly clear.

In FIG. 2, the guide bars 9 have completed their swing. It is now certain that the comb 11 has been able to seize only one weft thread 10, and will bring it behind the latch needles 13 for intermeshing with the warp threads.

In FIG. 3, the inward swing of the guide bars 9 has been executed, and it is clearly seen that the tongue-like support members 2 and 3 support the next-following weft threads 10 at a desired spacing one from the other and keep them separate. The comb 11 has brought the weft thread 10 seized in FIG. 2 behind the latch needles 13 and, during the next loop formation or intermeshing operation, can pick up again the weft thread 10 located on the tongue-like support member 3, unimpeded by the next-following weft thread, which remains yet on the support member 2. The operation shown in FIGS. 1 to 3 is repeated with each mesh formation and assures in a relatively simple manner, that no undesired doubled weft threads resulting from sagging thereof, can be introduced.

FIG. 4 shows a particularly advantageous embodiment of the invention, wherein a formed sinker 1 and several conventional eye needles 7 are combined in a needle block 8. By means of such a needle block, as many support points as desired can be provided within a guide bar, dependening upon the length of the weft threads and the weight of the weft thread material.

I claim:

1. In a warp knitting machine with devices for handling long weft threads and for feeding the threads to knitting tools of the machine and a guide bar carrying a plurality of eye needles having elongated shanks, means to support in separated relation weft threads fed to and extending along the knitting tools, at least one formed sinker also carried by the guide bar and comprising a pair of tongue-like support members extending at predetermined mutual spacing substantially parallel to one another and substantially perpendicularly to the shank of at least one of the eye needles of the guide bar, said support members having respective free ends defining an opening for the space between said substantially parallel support members, said opening facing in a direction toward said support means for the weft thread, said support members and said weft thread support means being relatively displaceable so as to transfer respective weft threads from said support means through said opening into the space between said support members.

2. A formed sinker according to claim 1 including a shank and a head formed with an eye corresponding to one of the eye needles, said tongue-like support members extending from said last-mentioned shank.

3. In a warp knitting machine according to claim 1, a needle block secured to the guide bar and having a multiplicity of the eye needles extending therefrom, said formed sinker also extending from said needle block.

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