July 22, 1941. E. LUCHSINGER 2,250,229

DEVICE FOR THE PRODUCTION OF LOOPED FABRICS

Filed July 25, 1940

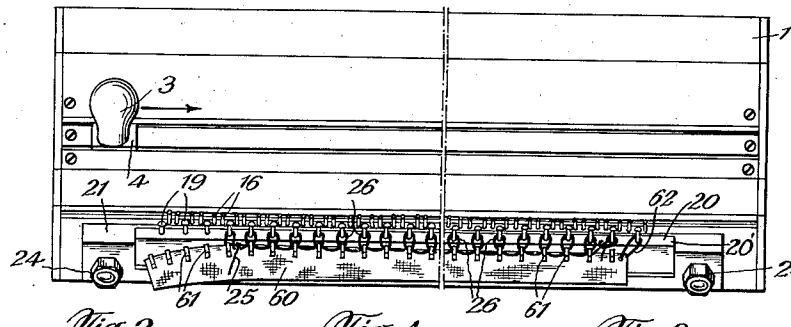


Fig. 1

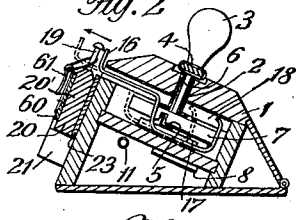


Fig. 2

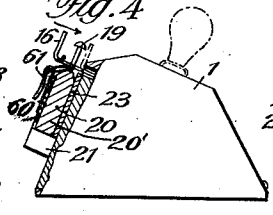


Fig. 4

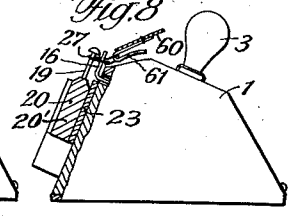


Fig. 8

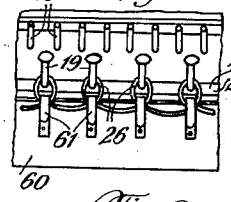


Fig. 3



Fig. 3a

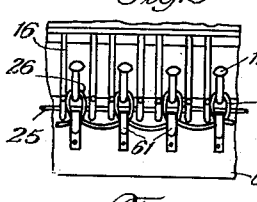


Fig. 5

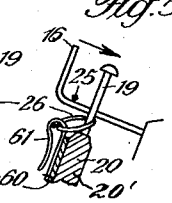


Fig. 5a

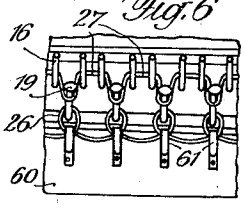


Fig. 6

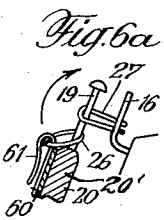


Fig. 6a

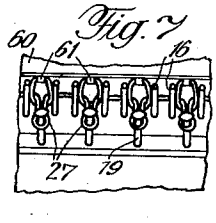


Fig. 7



Fig. 7a

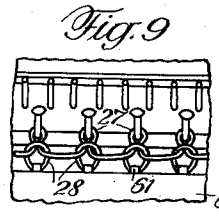


Fig. 9

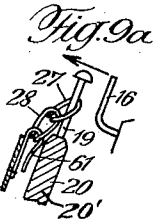


Fig. 9a

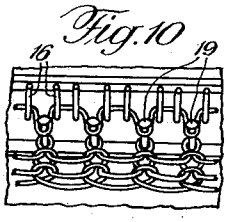


Fig. 10



Fig. 10a

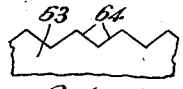


Fig. 11

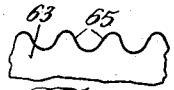


Fig. 12

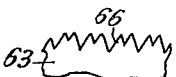


Fig. 13

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DEVICE FOR THE PRODUCTION OF LOOPED FABRICS

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Application July 25, 1940, Serial No. 347,545
In Switzerland August 4, 1939

6 Claims. (Cl. 66—4)

This invention relates to a device for producing looped fabrics which is provided with two sets of needles and wherein advancing the needles of one set serves to form a gap with the aid of the second set of needles so that the thereupon inserted work thread will be pulled out into zigzag loop formation by the subsequent withdrawal of the advanced needles so as to permit continuing the working after the first thread layer has been worked by the second set of needles.

In accordance with the invention, a flexible hook band is provided for the second set of needles, the hooks of which serve for receiving the thread loops formed by this set of needles during the start of the operation so that these loops can be thrown by means of the band over thread loops that are subsequently formed on similar sets of needles.

The aforesaid flexible hook band is therefore utilized even for forming the first row of loops, and, after a second row of loops has been formed, the hook band is raised up, whereupon the downward movement of the same, starting from one end and proceeding in a direction toward the other end, that is, gradually, serves to throw the first row of loops upon the second row of loops of the corresponding set of needles, this being therefore rendered possible without the expenditure of additional power; the set of needles carrying this row of loops being thereupon turned around 180° on the apparatus through agency of its support member; a new row of loops then being formed on this set of needles, and the cycle is then repeated. The hook band from the time of formation of the first row of loops remains uninterruptedly hooked thereon until a plurality of rows of loops is formed, and it is only after a workpiece of certain length has been produced that the hook bank is unhooked therefrom unless it is desired to leave it therein; the hook band prevents the finished loop structure from rolling together. The use of a flexible hook band also permits operations to be conducted with stiff threads, that is, it permits the production of correspondingly more rigid loops. In that case the hook band may be of very simple construction as by providing suitable hooks at one edge of the needle carrier. The sets of needles consist of simple shaft needles so that any needle carrier now in practical use may be utilized, and hence fine loops can also be produced.

In the accompanying drawing an embodiment of the invention is illustrated by way of example only, in which

Fig. 1 is a top plan view of the device according to the invention;

Fig. 2 shows a cross-section thereof;

Fig. 3 is a partial view, as seen from above, for explaining the beginning of the work;

Fig. 3*a* shows a cross-section of Fig. 3;

Fig. 4 shows a partial cross-section of the device in a different working condition compared with that shown in Fig. 2;

Fig. 5 is a partial view, as seen from above, for explaining the continuation of the work in the condition of operation of the device as shown in Fig. 4;

Fig. 5*a* shows a cross-section of Fig. 5;

Figs. 6 and 6*a* illustrate in a top plan view and a corresponding cross-section, respectively, a further working stage;

Figs. 7 and 7*a* illustrate in a top plan view and a corresponding cross section, respectively, still another working stage;

Fig. 8 is a partial cross-section of the device in the condition thereof shown in Figs. 7 and 7*a*;

Figs. 9 and 9*a* illustrate in a top plan view and a corresponding cross-section, respectively, a still further working stage;

Figs. 10 and 10*a* illustrate in a top plan view and a corresponding cross-section, respectively, another working stage, and

Figs. 11 to 13 are partial views of modifications of an individual working member.

The device is provided with an oblong casing 1 in the top of which a longitudinal slot 2 is arranged which serves for displaceably guiding a handle 3 which is secured, by means of a guide loop 4 to a longitudinal bar 5, the ends of which are fastened to the upper portion of the casing 1, beyond the slot 2. The handle 3 protrudes through the longitudinal slot 2 of the casing 1 by means of a flat neck 6 which carries a plate 7 which is positioned within the casing 1 and is provided with control cams on two opposite sides thereof serving for actuating needles 16 which are displaceably arranged in the casing 1 by means of a lower guide 17 and an upper guide 18. These needles can be displaced transversely of the casing 1 by corresponding displacements of a slide which is composed of the parts 3, 4, 6 and 7 and is guided on the longitudinal bar 5.

To the underside of the control plate 7 one of the ends of a band 8 is connected, which may, by way of example, consist of steel, and which passes over a guide roller positioned adjacent to one of the ends of the casing 1, the other end

of the band being attached to a tension spring 11 which passes over a guide roller and tends to retain the handle 3 in the end position shown on the left hand side of Fig. 1. By shifting the handle 3 to the right the needles 16 are advanced so as to project out of the casing 1 to a greater extent, as shown in dotted lines in Fig. 2. By shifting the handle 3 in the opposite direction the needles are retracted toward the casing again, that is, into the full line position shown in Fig. 2.

The numeral 19 designates the needles of a cooperative set which is arranged on a bar 20; said needles and bar thus forming a needle rake 20. This needle rake is inserted at its ends in two angular holders 21 which are united, by means of a web 23, into a single member, which is secured to the casing 1 by screws 24.

The needle set 19 is associated with an auxiliary member in the form of a band 60 which is provided along one of its longitudinal margins with hooks 61 the spacing of which corresponds to that of the needles 19. As shown in Fig. 1, one end of the band 60 is attached to the outermost right hand needle 19 (Fig. 1) by means of a loop 62.

The working is started with the needles 16 in retracted position relative to the casing 1, when the working thread 25 is slightly tied to that immovable left hand needle 19 of the needle rake 20 and the corresponding hook 61 of the band 60 where the looping is to begin, as indicated in Fig. 1, the thread being simply passed about the respective needle 19 and the associated hook 61.

Thereupon the thread 25 is loosely slung in the counter-clockwise direction about each hook 61 following to the right and the individual associated needles until the right hand needle 19 is reached which determines the width of goods required, whereupon the thread 25 is no longer slung about the hook 61 corresponding to the said right hand needle 19. This initial working operation being terminated in the manner illustrated in Figs. 1 and 3, the handle 3 is pulled to the right with regard to Fig. 1 whereby, by means of the plate 7, the needles 16 are advanced, that is, displaced in the direction of the arrow shown in Fig. 3.

Consequently the needles 16 enter into the spaces between the needles 19 and are then positioned above the first layer of thread which previously had been formed on the needles 19 of the rake 20 by looping the thread at 26. In this way a gap is formed by means of the needles 16 between the latter and the needles 19 in which gap the thread 25 is then placed in the opposite direction of traversing by beginning on the right hand side, as shown in Figs. 4 and 5.

Thereupon the handle 3 is returned into the left hand position, whereby the needles 16 are retracted by the control plate 7. By this means the working thread 25 is drawn out into zig-zag shaped loops 27 of uniform tension, as illustrated in Fig. 6, so that the thread then bears against the individual needles 16, 19 positioned within the range of operation of the two needle sets. Afterwards, first the thread loops 26 formed about the needles 19 are shifted upwardly on the needles 19 by accordingly folding and moving the band 60 upwardly in the direction of the arrow shown in Fig. 6*a*, whereupon the loops 26 are pulled off over the heads of the needles 19, so that only the second zig-zag shaped thread layer is retained on the needles 19 by the heads of these needles, as shown in Figs. 7, 7*a*. The loops 26 of the first thread layer having previously been moved by means of the hooks 61 on the knock-over band 60 have then accordingly been deposited on the needles 19 on top of the loops 27 of the second thread layer, in order to form stitches 28 by interlacing.

Thereupon, the needle rake 20 is removed from the casing 1 in the upward direction and then turned through an angle of 180° and inserted in the holders 21 in the corresponding position, by which means the end of the needle rake 20 having previously been positioned on the left hand side of the casing 1 is removed to the right hand side of the casing, so that the hooks 61 of the band 60 then face toward the rake 20 as shown in Fig. 9*a*, whereas they had previously been facing away from the rake 20. Afterwards, the needles 16 are advanced again in the direction of the arrow shown in Fig. 9*a* by shifting the handle 3 to the right. In this way the two needle sets form again a gap between them into which the thread 25 is placed, whereupon the needles 16 are retracted anew and the other operations are performed as required for interlacing the row of loops in the manner explained above.

As soon as a certain number of stitches has been produced and thus an according portion of the work is completed the band 60 may be removed from the work in that the interlacing of the loops into stitches can then be effected by means of a bar 63 which, as shown in Figs. 11 to 13, is provided with a toothed longitudinal edge for engagement with the looped fabric from below, as indicated in chain-dotted lines in Fig. 10*a* for detaching the fabric from the needles 19 by accordingly folding and moving the band 60 upwardly, as previously described. Thereupon the needle rake 20 is turned end for end through an angle of 180° relative to the casing, so that the looped fabric is again positioned in front.

As shown in Fig. 11, the bar 63 is provided with pointed teeth 64, whereas Fig. 12 shows rounded off teeth 65, and Fig. 13 depicts teeth with intervening tooth gaps of different depths forming a repeat of pattern in the row of teeth, or serrations.

The needle rake 20 is preferably secured in position in the holders 21 by the arrangement of a spring pressed locking ball on each vertical engagement face of the holders, for the purpose of engaging with a corresponding recess in the needle rake 20.

Between the casing 1 and the web 23 carrying the two holders 21 an insert may be arranged for the purpose of varying the distance between the needles 19 on the rake 20 from the needles 16 in the advanced position of the latter in order that accordingly wider or narrower stitches may be effected.

In the embodiment of the invention shown, two needles 16 enter, in the advanced position of these needles, between each two adjacent needles 19, but the arrangement may also be such that, for example, between each two adjacent needles 19 on the rake 20 only one neede 16 or more than two needles 16 penetrate while advancing.

Instead of a flexible band 60 a rigid member may be used for carrying the hooks 61, such as, for example, a hook carrier bar or the like.

I claim:

1. In a device for the production of looped textile goods, a stationary needle set for the formation of a first row of loops thereon by

means of the working thread, a second displaceable needle set for forming a thread receiving gap between said two needle sets by conjointly advancing the needles of said second set between said stationary needles of said first set, control means for advancing and retracting the needles of said second set between the needles of said first set, and an auxiliary knock-over member associated with said first needle set for depositing said first row of loops on further loops having been formed on said needles of said first set, for effecting stitches by interlacing said first loops with said further loops.

2. In a device for the production of looped textile goods, a stationary needle set for the formation of a first row of loops thereon by means of the working thread, a second displaceable needle set for forming a thread receiving gap between said two needle sets by conjointly advancing the needles of said second set between said stationary needles of said first set, control means for advancing and retracting the needles of said second set between the needles of said first set, an auxiliary knock-over member associated with said first needle set, and thread holding elements arranged on said member, said holding elements being spaced apart from each other distances equalling the spacings of said needles of said first needle set, for depositing said first row of loops on further loops having been formed on said needles of said first set, for effecting stitches by interlacing said first loops with said further loops.

3. In a device for the production of looped textile goods, a stationary needle set for the formation of a first row of loops thereon by means of the working thread, a second displaceable needle set for forming a thread receiving gap between said two needle sets by conjointly advancing the needles of said second set between said stationary needles of said first set, control means for advancing and retracting the needles of said second set between the needles of said first set, an auxiliary knock-over member associated with said first needle set, and hooks arranged on said member, said hooks being spaced apart from each other intervals equalling the intervals between the needles of said first needle set, for depositing said first row of loops on further loops having been formed on said needles of said first set, for effecting stitches by interlacing said first loops with said further loops.

4. In a device for the production of looped textile goods, a stationary needle set for the formation of a first row of loops thereon by means of the working thread, a second displaceable needle set for forming a thread receiving gap between said two needle sets by conjointly advancing the needles of said second set between said stationary needles of said first set, control means for advancing and retracting the needles of said second set between the needles of said first set, and a band serving as a knock-over member associated with said first needle set for depositing said first row of loops on further loops having been formed on said needles of said first set, for effecting stitches by interlacing said first loops with said further loops.

5. In a device for the production of looped textile goods, a stationary needle set for the formation of a first row of loops thereon by means of the working thread, a second displaceable needle set for forming a thread receiving gap between said two needle sets by conjointly advancing the needles of said second set between said stationary needles of said first set, control means for advancing and retracting the needles of said second set between the needles of said first set, and a bar shaped element serving as a knock-over member associated with said first needle set for depositing said first row of loops on further loops having been formed on said needles of said first set, for effecting stitches by interlacing said first loops with said further loops.

6. In a device for the production of looped textile goods, a stationary needle set for the formation of a first row of loops thereon by means of the working thread, a second displaceable needle set for forming a thread receiving gap between said two needle sets by conjointly advancing the needles of said second set between said stationary needles of said first set, control means for advancing and retracting the needles of said second set between the needles of said first set, a bar shaped element serving as a knock-over member, and a serrated longitudinal edge on said element for depositing said first row of loops on further loops having been formed on said needles of said first set, for effecting stitches by interlacing said first loops with said further loops.

ERNST LUCHSINGER.