March 21, 1950 J. GROSZMANN 2,501,045

DEVICE FOR FORMING LOOPED MESH FABRICS

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Fig. 1

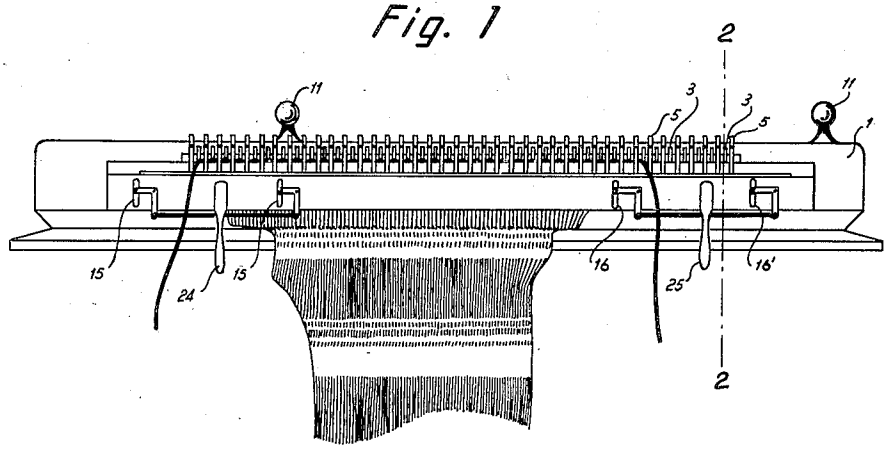


Fig. 2

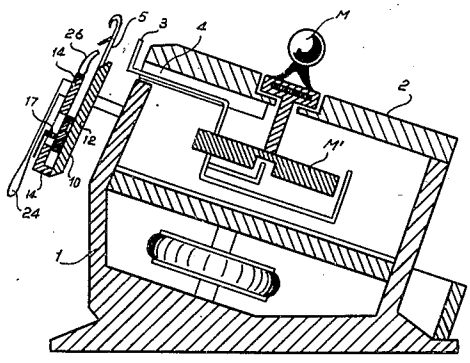
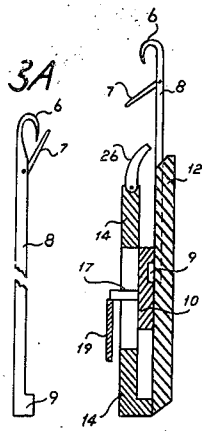


Fig. 3

Fig. 3A



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Fig. 4

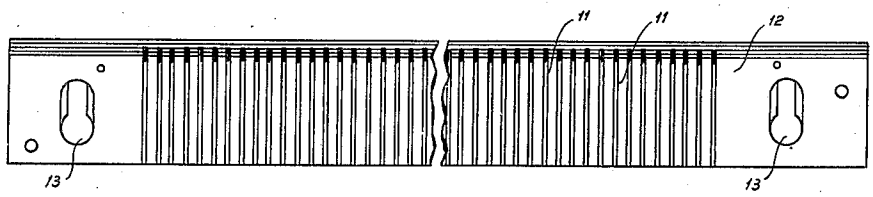


Fig. 5

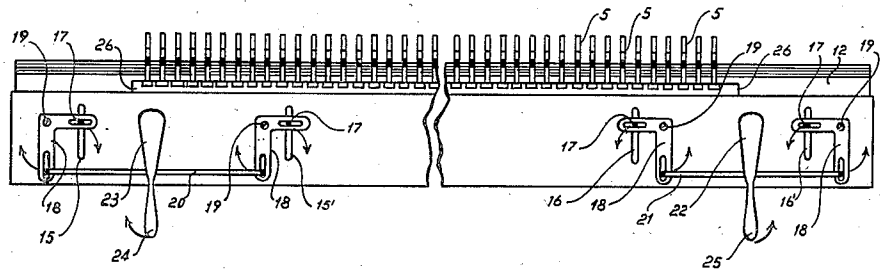


Fig. 6

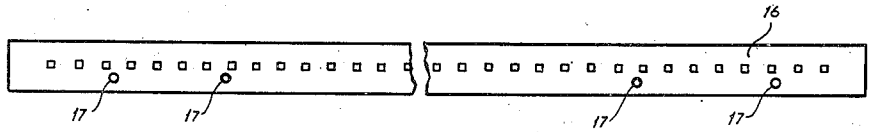
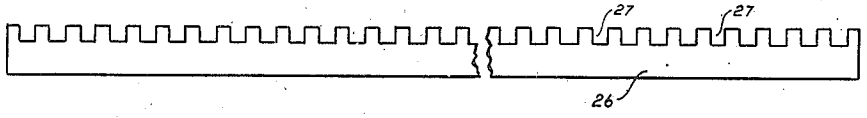


Fig. 7



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Fig. 8

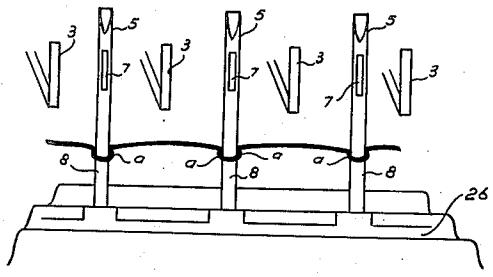


Fig. 9

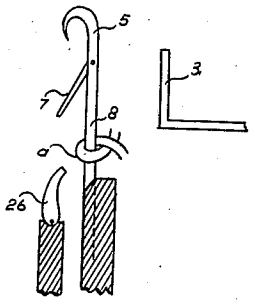


Fig. 10

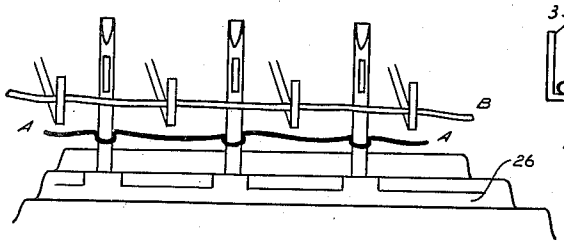


Fig. 11

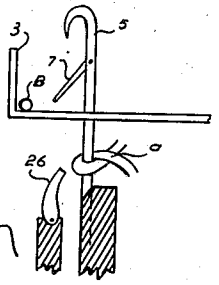


Fig. 12

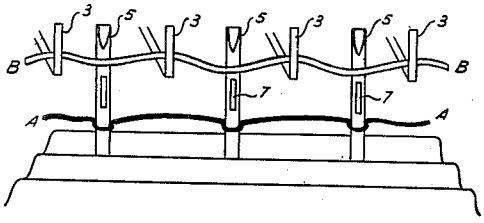


Fig. 13

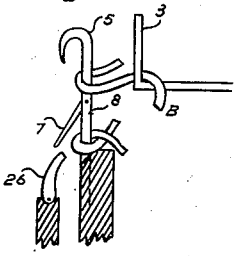


Fig. 14

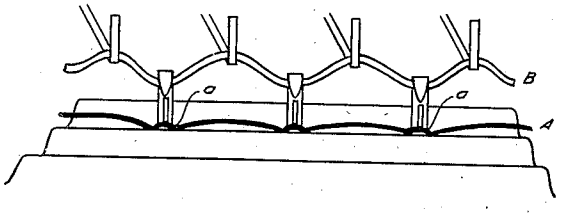
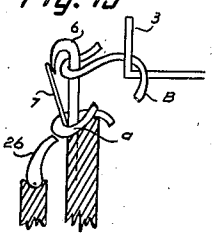


Fig. 15



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Fig. 16

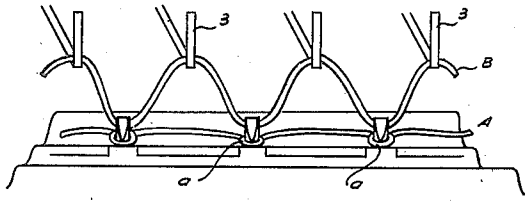


Fig. 17

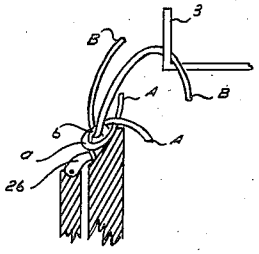


Fig. 18

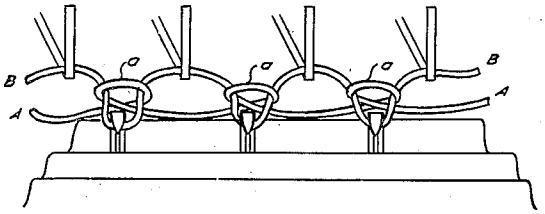
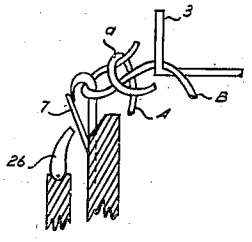


Fig. 19



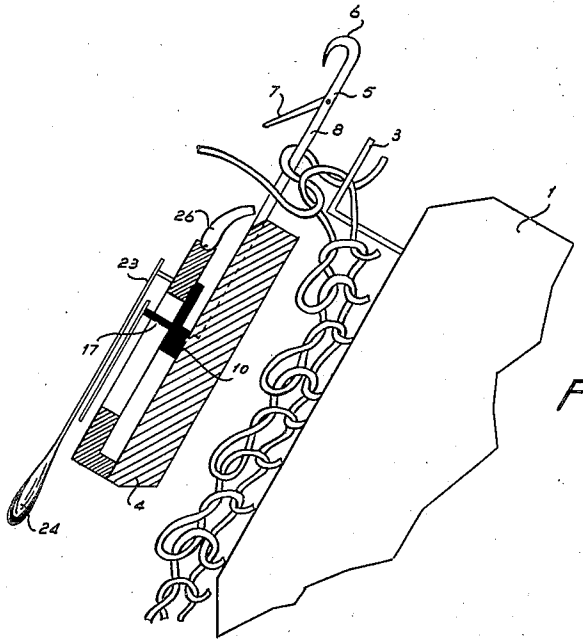


Fig. 20

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Patented Mar. 21, 1950

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UNITED STATES PATENT OFFICE

2,501,045

DEVICE FOR FORMING LOOPED MESH FABRICS

José Groszmann, Barcelona, Spain

Application May 31, 1946, Serial No. 673,354

5 Claims. (Cl. 66—82)

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This invention relates to a device for the manufacture of a looped fabric or mesh wherein a set of hooks cooperates with a set of needles located at right angles thereto.

It is an object of the invention to provide an apparatus of the above type whereby looped fabrics heretofore generally made by hand with knitting needles may be rapidly and uniformly manufactured.

A further object of the invention is to provide a construction wherein all of the needles entering into the operation may be simultaneously moved upwardly or downwardly as desired.

A further object of the invention is to provide needles of the tongue and hook type provided with a heel which serves as the connecting element with the means for moving the needles in unison.

A still further object of the invention is to provide a set of hooks with each hook located between two consecutive needles and mounted so as to be movable at right angles to the path of the needles. The bent ends of said hooks extend in a direction parallel to the body of the needles.

A still further object of the invention is to provide means for releasing or expelling the manufactured mesh.

With the above and other objects in view which will become apparent from the detailed description below a preferred form of the invention is described below and shown in the drawings in which:

Fig. 1 is a front elevational view of a preferred form of the invention.

Fig. 2 is a cross-sectional view taken upon section line 2—2 of Fig. 1.

Fig. 3 is a cross-sectional view taken through the needle case.

Fig. 3A is an elevational view of one of the needles.

Fig. 4 is a broken front view of the needle guideplate.

Fig. 5 is a broken front elevational view of the front portion of the apparatus.

Fig. 6 is a broken elevational view of the needle supporting bar.

Fig. 7 is a broken elevational view of the mesh ejecting means.

Figs. 8 to 20, inclusive, are schematic views illustrating the successive steps in the formation of a looped fabric.

In the drawings wherein like reference characters refer to like parts in the various views the box 1 is provided with a lid 2. Supported from

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the lid 2 is a reciprocating driving member M and M' for operating the hooks 3. The hooks 3 are positioned intermediate adjacent needles 5 and during their reciprocating motion are moved from a position in the rear of the needles 5 to a position in advance of the needles 5.

The drive M and M' may be of any desired type for reciprocating the hooks 3. Such reciprocation may take place simultaneously or in sections. The hooks 3 are positioned in slots 4 which may be provided upon the lid 2 or upon a member attached to the lid. The bent ends of the hooks 3 are turned so as to extend parallel with the needles 5.

The needles 5 (see Fig. 3A) comprises a hook 6, a pivoted tongue 7, a body 8 and a heel 9. The heel 9 serves to secure the needles to the longitudinal bar 10.

The bodies of the needles rest and are guided in the grooves or slots 11 upon the needle guide 12 (Fig. 4). The guide 12 is secured to the front of the apparatus by transverse bolts extending through the openings 13 and which permit adjustment. The upper portion of the guide 12 is beveled.

A box like formation is formed by the element 14 secured to the needle guide 12 wherein the longitudinal bar 10 is disposed. The element 14 is provided in its front side with parallel slots 15, 15' and 16, 16' through which extend the pins 17 fixed to the supporting bar 10. The pins 17 are engaged by the slotted ends of bell crank levers 18 pivoted at 19 upon element 14. The free ends of the levers 18 are coupled in pairs by the rods 20 and 21 which may be actuated by the vertical levers 22 and 23 provided with the grips 24 and 25 respectively. A reciprocating movement of the rods 20 and 21 will bring about a simultaneous rise and fall of all the needles 5.

The ejecting bar 26 for the ejection of the manufactured mesh is shown in Figs. 2, 3, 5 and 7 and comprises a bar having the same length as the extent of the needles and being provided at its operating edge with a series of slots or grooves 27 spaced in accordance with the spacing between the needles.

The operation is as follows:

The first step is shown in Figs. 8 and 9 wherein the apparatus is shown with the hooks 3 in their rearward position and with the needles 5 in raised position with the tongues 7 in open position, that is, with the hooks 6 open. In order to start a thread A is threaded by hand about all the bodies of the needles with a turn *a* being given about each needle.

Then as shown in Figs. 10 and 11 the hooks 3 are advanced by manipulating the drive M until the hooks reach their extreme forward position and project beyond the row of needles. A thread B is then placed in the angle made by the bent over ends of the hook and the body of the hook. The thread B is positioned throughout the entire width of the apparatus upon a series of hooks that correspond in number to the needles being used.

The next step of the operation is shown in Figs. 12 and 13 wherein the hooks are withdrawn and returned to the original position as shown in Figs. 8 and 9. However in this case the thread B is held by the hooks above the line of pivoted tongues 7.

Then as shown in Figs. 14 and 15 the grips 24 and 25 are operated to lower all the needles 5 simultaneously. The needles 5 will slide through the loop *a* closing the pivoted tongues 7 upon the thread B lodged within the hooks 6.

The next step is the ejection of the mesh as shown in Figs. 16 and 17 wherein as the needles are lowered the bar 26, in combination with this movement, is turning and placing the projections thereof underneath the loops *a*, pushing it and making it come out above the hook.

The ejected mesh or the loop *a* now forms the stitch as shown in Figs. 18 and 19 and the thread B is retained in the hooks 6 for the following step which takes place by raising the needles 5 so that the thread B will exert a pressure upon the back of the pivoted tongues 7 and open them. The elements are then in the same initial position as shown in Figs. 8 and 9 with the thread B forming a loop about the body of each needle.

The fabric formed as shown in Fig. 20 escapes through the space between the plate 12 and the front of the box 1 and a winding tightener for such fabric may be attached.

The essential features of the invention have been described above and they may be utilized in practice with various modifications.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A device for forming looped mesh fabrics comprising a set of hook needles for the formation of a first row of loops from a working thread, a heel upon each needle, a bar having apertures therein for receiving said heels, a guide for said needles, means for reciprocating said bar and consequently said needles as a unit, a set of hooks reciprocatingly mounted at right angles to and intersecting the path of movement of said needles for forming further loops in said thread and means coordinated with the movement of said needles for stripping said first loops from said needles over said further loops.

2. A device as set forth in claim 1 in which said needles are provided with pivoted tongues for securing said further loops during the stripping of said first loops.

3. A device as set forth in claim 1 wherein said means for reciprocating said bar comprises pivoted bell crank levers and means for operating said levers in unison.

4. A device as set forth in claim 1 in which said needles are provided with automatically opening tongues for securing said further loops during the stripping of said first loops.

5. A device as set forth in claim 4 wherein said automatically opening tongues are closed by being drawn through the lower loop of another thread around the same needle.

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