

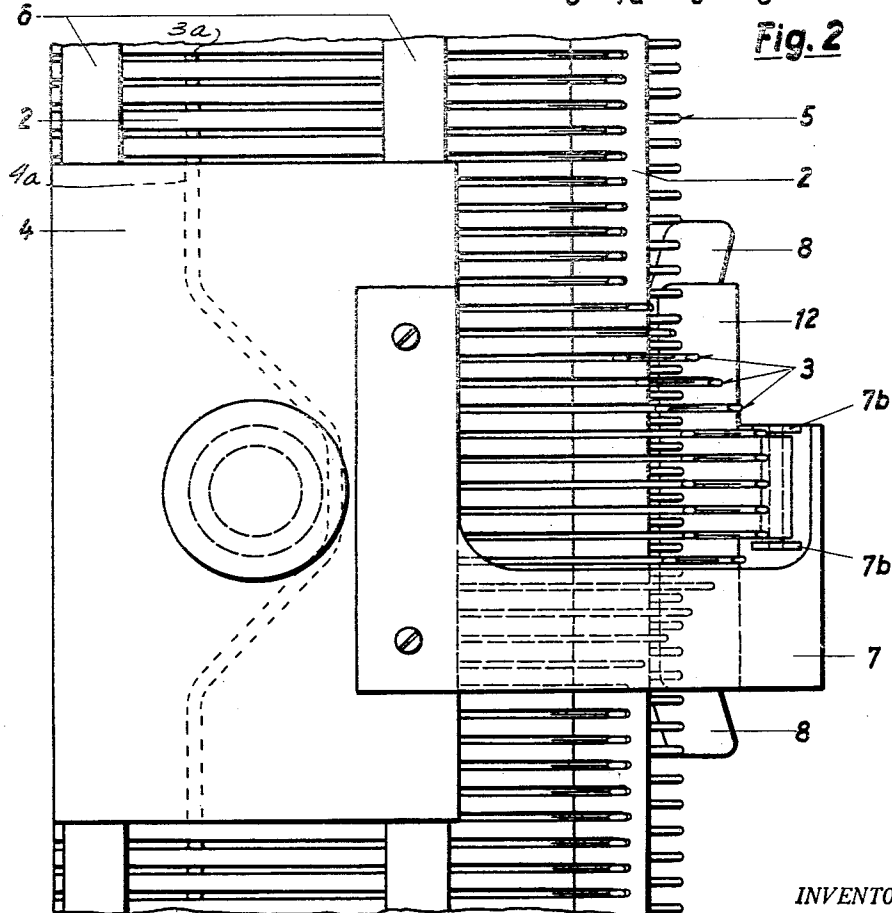
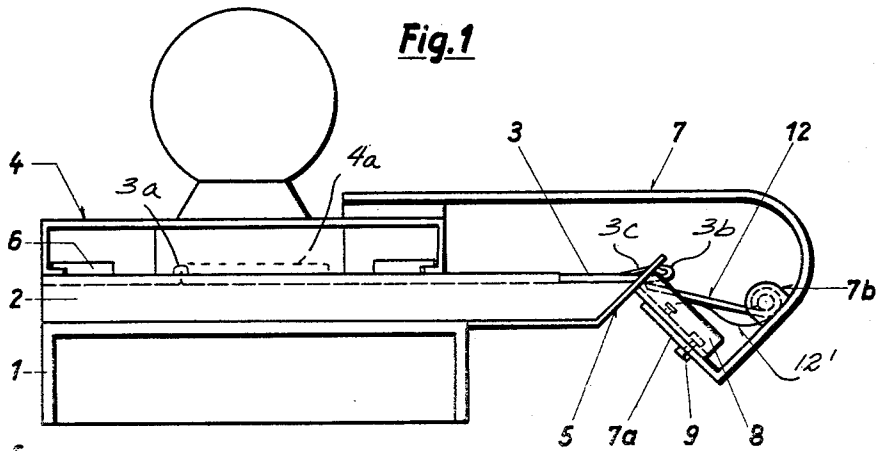
Aug. 16, 1955

J. BÜHRER
KNITTING APPARATUS

2,715,328

Filed June 10, 1954

3 Sheets-Sheet 1



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Aug. 16, 1955

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3 Sheets-Sheet 2

Fig. 3

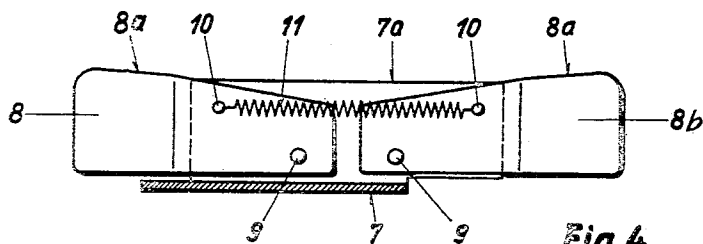
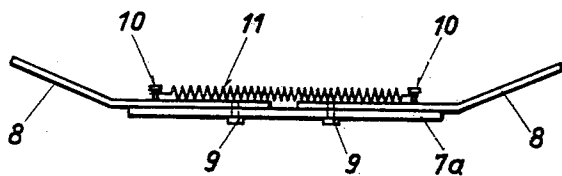


Fig. 4

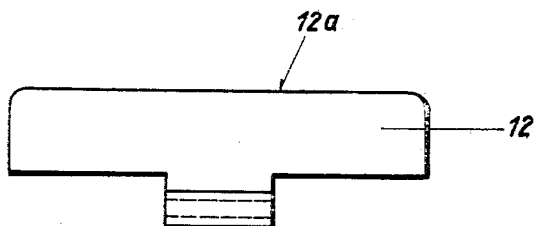


Fig. 5

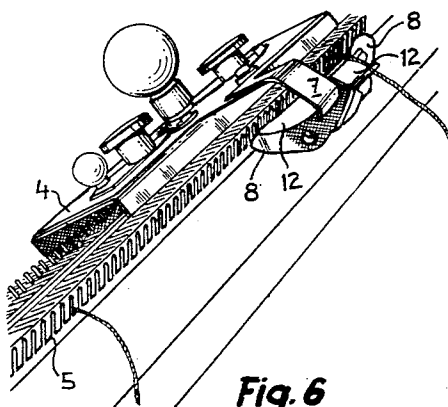


Fig. 6

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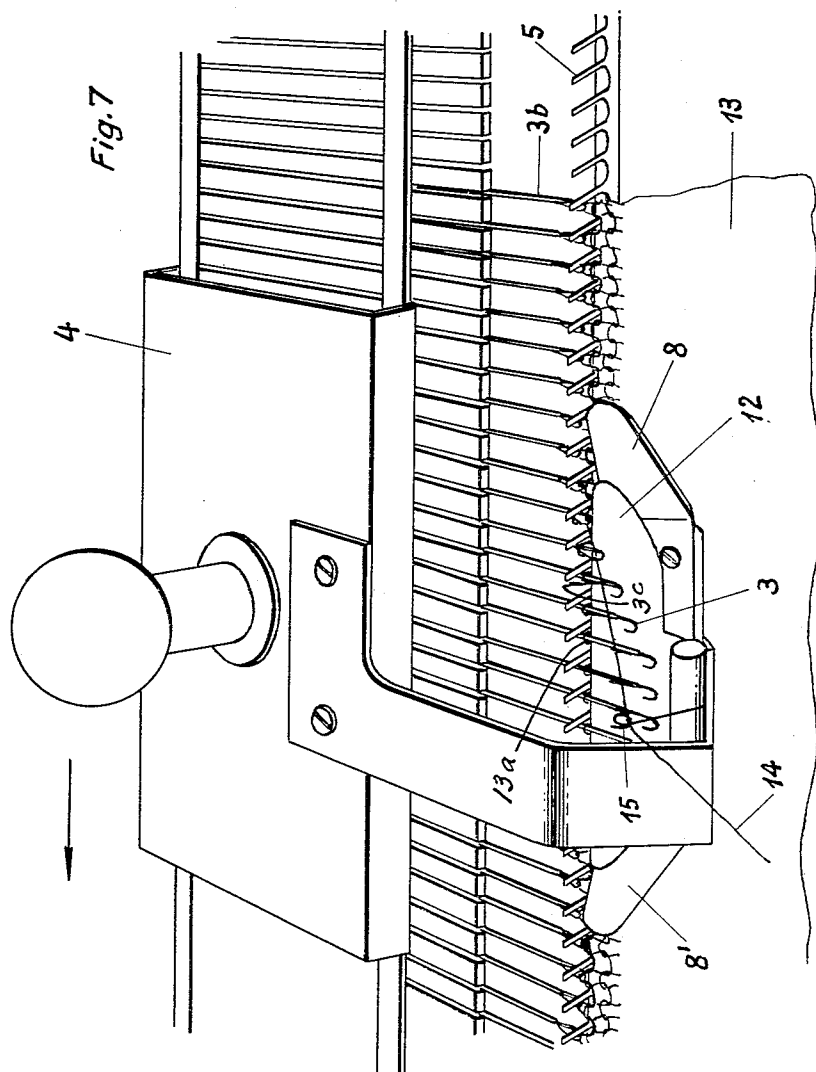
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2,715,328

Filed June 10, 1954

3 Sheets-Sheet 3



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KNITTING APPARATUS

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Application June 10, 1954, Serial No. 435,848

Claims priority, application Switzerland June 20, 1953

12 Claims. (Cl. 66—60)

The present invention relates to a knitting apparatus, and more particularly to straight knitting apparatus having a vertically arranged retaining needle comb, and a set of horizontally movable needles.

It is known to provide means for pulling down the work piece knitted on a straight knitting machine. For this purpose generally a special needle comb, weights, or sinkers are provided whereby the construction of the machine is complicated.

It is one object of the present invention to provide a knitting apparatus in which the finished part of the work piece is guided downwardly away from the needles on which it is suspended by newly formed loops so that a loop retaining means sliding along the needle comb engages only the loops on which the work piece is suspended and is prevented from engaging the work piece itself.

It is a further object of the present invention to provide a pair of work piece guiding means projecting over both ends of the retaining means so that the work piece is guided out of the path of the retaining means regardless of the direction of reciprocating movement of the actuating means and retaining means.

It is a still further object of the present invention to resiliently urge the work piece guiding means against the needle comb.

It is yet another object of the present invention to provide an inclined work piece guiding means for guiding the work piece out of the path of the retaining means.

With these objects in view the present invention mainly consists in a knitting apparatus comprising, in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being movable through the needle comb between a retracted position in which the hooked end portions are located on one side of the needle comb and an advanced position in which the hooked end portions are located on the other side of the needle comb; actuating means movable in longitudinal direction of the needle comb and consecutively engaging the needles during movement thereof for consecutively moving each of the needles from the retracted position to the advanced position and back again through the needle comb so that the needle comb retains on the other side thereof a knitted work piece suspended on newly formed suspending loops passing through the hooked end portions of the needles when the needles have moved to the retracted position; a retaining means secured to the actuating means for movement therewith along a path parallel to the needle comb and being located on the other side of the needle comb adjacent to the same and directly under those needles which are moved by the actuating means so as to engage the suspending loops for pulling the same out of the hooked end portions when the needles move to the advanced position; and work piece guiding means secured to the actuating means for movement with the same in the longitudinal direction, the work piece guiding means being located on the other side of the needle comb and forwardly in the longitudinal direction

of movement with respect to the retaining means, the work piece guiding means being adapted to engage a work piece suspended on the suspending loops and to downwardly guide the same out of the path of the retaining means.

Preferably, two work piece guiding means are provided, each work piece guiding means being arranged outwardly of one end of the retaining means so that the work piece is guided out of the path of the retaining means regardless of the direction of movement of the actuating means and retaining means during reciprocating movement of the actuating means.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is an end view of the knitting apparatus according to the present invention;

Fig. 2 is a fragmentary plan view of a portion of the knitting apparatus of the present invention;

Fig. 3 is a front view of a constructive detail of the present invention;

Fig. 4 is a plan view of a detail;

Fig. 5 is a plan view of a retaining means according to the present invention;

Fig. 6 is a fragmentary isometric view of an embodiment of the present invention; and

Fig. 7 is a fragmentary isometric view of the arrangement according to the present invention shown on a larger scale.

Referring now to the drawings, and more particularly to Figs. 1 and 2, on a supporting means 1, a needle bed 2 is arranged which is provided with grooves for guiding the set of needles 3 for movement in a substantially horizontal plane between a retracted position and an advanced position, as best seen in Fig. 2. During movement from retracted to advanced position, the needles 3 pass through the needle comb 5 which is mounted on the supporting means 1 and is inclined with respect to the needle bed.

The needles 3 are provided with projections 3a in the shank portions of the same which are engaged by needle shifting means such as a cam track 4a of the actuating means 4 so that the groups of needles are consecutively advanced and retracted when the actuating means 4 move in longitudinal direction of the apparatus and of the needle comb 5. The actuating means 4 is guided on longitudinally extending guide rails 6 which are located above the needles 3. The needles have hooked end portions 3b which are provided with tongues 3c which normally close the hooked end portion 3b.

An arm member 7 is secured to the actuating means 4 and projects beyond the needle comb to the other side of the same. The arm member 7 supports work piece guiding means 8 and retaining means 12 which will be described in greater detail hereinafter.

The outer end portion 7a of the arm member 7 is bent so that it extends substantially perpendicular to the needle comb 5. Two tongues 8, constituting work piece guiding means, are pivotally mounted on the portions 7a of the arm member 7 by means of pins 9. The arrangement is such that the tongues 8 extend substantially perpendicular to the needle comb 5 and are turnable in a plane perpendicular to the same. A spring 11, best seen in Figs. 3 and 4 is secured by pins 10 to the work piece guiding tongues 8 so that the same are urged by spring 11 to pivot about the pins 9 toward the needle comb 5. The end portions of the tongues 8 extend in longitudinal direction beyond the ends of the retaining means 12 so

that they are forwardly located in the longitudinal direction of movement with respect to the retaining means 12.

The end portions 8b of the work piece guiding tongues 8 are upwardly inclined, as best seen in Fig. 3. The edges 8a of the outwardly bent end portions of the tongues 8 engage the needle comb. The outermost ends of the work piece guiding tongues are located directly underneath the needles 3.

The retaining means 12 is turnably mounted on lugs 7b on the arm member 7 for turning movement about an axis substantially parallel to the needle comb 5 and to the direction of movement of the actuating means 4 and of the arm member 7. A resilient means 12' is secured to the arm member 7 and urges the retaining means 12 into engagement with the needle comb 5. The front edge 12a of the retaining means 12, best seen in Fig. 5, engages the needle comb directly underneath the hooked end portions of the needles 3 so as to engage suspending loops passing through the hooked end portions 3b and to pull the same out of the hooked end portions 3b when the needles 3 are moved to an advanced position. During such advancing movement of the needles, the loops retained by the retaining means 12 open the tongues 3c so that the suspending loops slide onto the shank portions of the needles.

As best seen in Fig. 7, a thread guiding means 15 is also secured to the arm member 7 for guiding a thread 14 into the hooked end portions of the advanced needles.

The apparatus operates in the following manner:

When the actuating means 4 are moved in the direction of the arrow in Fig. 7, the needle shifting means 4a shift groups of needles to advanced position and back. The work piece guiding means 8' which is located forwardly during movement in the direction of the arrow, engages with its end portion the needle comb 5 directly underneath the operating plane of the needles 3. Since the end portion of the work piece guiding means is upwardly inclined, the work piece engaged thereby is downwardly urged away from the operating plane of the needles 3 so that the retaining means 12, which engages the needle comb directly underneath the operating plane of the needles 3, slides only along the suspending loops 13a which pass through the hooked end portions 3b of the needles 3, and is prevented from engaging the work piece 13 which is suspended on the suspending loops 13a. During movement of the needle shifting means 4a of the actuating means 4, the needles 3 are advanced to an advanced position, and during such movement the suspending loops 13a are retained by the retaining means 12 so that the suspending loops 13a pass onto the shank portions of the needles, and open the tongues 3c so that the hooked end portions 3b are open when the needles 3 arrive in their advanced positions.

The thread guiding means 15 inserts the thread 14 into the open hooked end portions of the needles so that the thread is held in the hooked end portions of the needles when the tongues 3c are closed by the suspending loops 13a during movement of the needles to retracted position. In this moment, new suspending loops are formed by the newly inserted thread, while the old suspending loops slide over the closed hooked end portions and become part of the work piece, and are later on pushed down by the work piece guiding means 8 during the next reciprocating movement of the actuating means 4.

It is therefore apparent that the retaining means 12 serve for retaining the suspending loops 13a during the movement of the needles to advanced position, and that the tongues or work piece guiding means 8 serve the purpose of guiding the work piece away from the needles and out of the path of the retaining means 12 so that all loops of the work piece, with the exception of the suspending loops 13a, are held underneath the retaining means 12. Two work piece guiding means 8 are provided for guiding the work piece out of the way of the

retaining means during reciprocating movement of the actuating means in opposite directions.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of knitting apparatus differing from the types described above.

While the invention has been illustrated and described as embodied in a knitting apparatus including guiding means for guiding the work piece out of the way of a retaining means for the newly formed loops of the work piece, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a knitting apparatus in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being located in an operating plane and movable through said needle comb between a retracted position in which said needles are located on one side of said needle comb and an advanced position in which said hooked end portions project through said needle comb to the other side of the same; actuating means movable in longitudinal direction of said needle comb and having needle shifting means consecutively engaging groups of said needles during such movement for consecutively moving said needles from said retracted to said advanced position and back, so that said needle comb retains a knitted workpiece on said other side thereof suspended on suspending loops passing through said hooked end portions of said needles when the same have moved to said retracted position; a work piece guiding means secured to said actuating means and located on said other side of said needle comb adjacent to the same and moving along said needle comb, said guiding means being arranged in the longitudinal direction of movement of said actuating means forwardly of said needle shifting means for moving said retained work piece out of said operating plane of said needles; and retaining means on said actuating means arranged in said longitudinal direction of movement between said engaging means and said work piece guiding means on said other side of said needle comb and adjacent to the same for engaging during movement of said actuating means said suspending loops and for retaining the same adjacent to said needle comb during movement of said needles from said retracted into said advanced position thereof.

2. A knitting apparatus, in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means movable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; a retaining means secured to said actuating means for movement therewith along a

5

path parallel to said needle comb and being located on said other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; and work piece guiding means secured to said actuating means for movement with the same in said longitudinal direction, said work piece guiding means being located on said other side of said needle comb and forwardly in said longitudinal direction of movement with respect to said retaining means, said work piece guiding means being adapted to engage a work piece suspended on said suspending loops and to downwardly guide the same out of the path of said retaining means.

3. A knitting apparatus, in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; a retaining means secured to said actuating means for movement therewith along a path parallel to said needle comb and being located on said other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; and a pair of work piece guiding means secured to said actuating means for movement with the same in said longitudinal direction, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means regardless of the direction of reciprocating movement of said actuating means, said work piece guiding means being adapted to engage a work piece suspended on said suspending loops and to downwardly guide the same out of the path of said retaining means.

4. A knitting apparatus, in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; an arm member secured to said actuating means; a retaining means secured to said arm member for movement with said actuating means along a path parallel to said needle comb and being located on the other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means so as to engage said suspending loops for

6

pulling the same out of said hooked end portions when said needles move to said advanced position; a pair of work piece guiding means secured to said arm member for movement with said actuating means in said longitudinal direction, each of said work piece guiding means being movably mounted on said arm member for movement towards and away from said needle comb, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means regardless of the direction of reciprocating movement of said actuating means; and means urging said work piece guiding means into engagement with said needle comb so that said work piece guiding means engage a work piece suspended on said suspending loops and downwardly guide the same out of the path of said retaining means.

5. A knitting apparatus, in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; an arm member secured to said actuating means; a retaining means secured to said arm member for movement with said actuating means along a path parallel to said needle comb and being located on the other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; a pair of work piece guiding means secured to said arm member for movement with said actuating means in said longitudinal direction, each of said work piece guiding means being pivotally mounted on said arm member for movement towards and away from said needle comb, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means regardless of the direction of reciprocating movement of said actuating means; and spring means urging said work piece guiding means into engagement with said needle comb so that said work piece guiding means engage a work piece suspended on said suspending loops and downwardly guide the same out of the path of said retaining means.

6. A knitting apparatus as claimed in claim 5 including a pivot pin supporting said work piece guiding means turnable in a plane extending substantially perpendicular to said needle comb.

7. A knitting apparatus, in combination, an elongated needle comb; a row of spaced substantially horizontal needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from

7

said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; a retaining means secured to said actuating means for movement therewith along a path parallel to said needle comb and being located on said other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; and a pair of work piece guiding means secured to said actuating means for movement with the same in said longitudinal direction, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means during reciprocating movement of said actuating means, each of said work piece guiding means being in said longitudinal direction of movement upwardly inclined so that the outermost ends of said work piece guiding means are located directly underneath said needles and adapted to engage a work piece suspended on said suspending loops directly underneath said needles so that said work piece is guided by said inclined guiding means downwardly away from said needles and out of the path of said retaining means.

8. A knitting apparatus, in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; a retaining means mounted on said actuating means for movement therewith and being turnable about an axis extending parallel to said longitudinal direction, said retaining means being located on said other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; and a pair of work piece guiding means secured to said actuating means for movement with the same in said longitudinal direction, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means regardless of the direction of reciprocating movement of said actuating means, said work piece guiding means being adapted to engage a workpiece suspended on said suspending loops and to downwardly guide the same out of the path of said retaining means.

9. A knitting apparatus, in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked

8

end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; a retaining means mounted on said actuating means for movement therewith and being turnable about an axis extending parallel to said longitudinal direction, said retaining means being located on said other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means; resilient means urging said retaining means to turn about said axis toward said needle comb so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; and a pair of work piece guiding means secured to said actuating means for movement with the same in said longitudinal direction, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means regardless of the direction of reciprocating movement of said actuating means, said work piece guiding means being adapted to engage a work piece suspended on said suspending loops and to downwardly guide the same out of the path of said retaining means.

10. A knitting apparatus, in combination, an elongated needle comb; a row of spaced needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; an arm member secured to said actuating means; a retaining means secured to said arm member for movement with said actuating means along a path parallel to said needle comb and being located on the other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means, said retaining means being mounted on said arm member turnable about an axis extending parallel to said longitudinal direction, said retaining means being movable with said arm member and with said actuating means; resilient means urging said retaining means to turn about said axis toward said needle comb so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; a pair of work piece guiding means secured to said arm member for movement with said actuating means in said longitudinal direction, each of said work piece guiding means being pivotally mounted on said arm member for movement towards and away from said needle comb, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means

regardless of the direction of reciprocating movement of said actuating means; and means urging said work piece guiding means into engagement with said needle comb so that said workpiece guiding means engage a work piece suspended on said suspending loops and downwardly guide the same out of the path of said retaining means.

11. A knitting apparatus, in combination, an elongated needle comb; a row of spaced substantially horizontal needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; an arm member secured to said actuating means; a retaining means secured to said arm member for movement with said actuating means along a path parallel to said needle comb and being located on the other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; a pair of work piece guiding means secured to said arm member for movement with said actuating means in said longitudinal direction, each of said work piece guiding means being movably mounted on said arm member for movement towards and away from said needle comb, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means during reciprocating movement of said actuating means, each of said work piece guiding means being in said longitudinal direction of movement upwardly inclined so that the outermost ends of said work piece guiding means are located directly underneath said needles and adapted to engage a work piece suspended on said suspending loops directly underneath said needles so that said work piece is guided by said inclined guiding means downwardly away from said needles and out of the path of said retaining means; and spring means urging said work piece guiding means into engagement with said needle comb.

12. A knitting apparatus, in combination, an elongated needle comb; a row of spaced substantially horizontal needles having hooked end portions and being movable through said needle comb between a retracted position in which said hooked end portions are located on one side of the needle comb and an advanced position in which said hooked end portions are located on the other side of said needle comb; actuating means reciprocable in longitudinal direction of said needle comb and consecutively engaging said needles during movement thereof for consecutively moving each of said needles from said retracted position to said advanced position and back again through said needle comb so that said needle comb retains on said other side thereof a knitted work piece suspended on newly formed suspending loops passing through said hooked end portions of said needles when said needles have moved to said retracted position; an arm member secured to said actuating means; a retaining means secured to said arm member for movement with said actuating means along a path parallel to said needle comb and being located on the other side of said needle comb adjacent to the same and directly under those needles which are moved by said actuating means so as to engage said suspending loops for pulling the same out of said hooked end portions when said needles move to said advanced position; a pair of work piece guiding means secured to said arm member for movement with said actuating means in said longitudinal direction, each of said work piece guiding means being pivotally mounted on said arm member for movement towards and away from said needle comb, said work piece guiding means being located on said other side of said needle comb outwardly spaced from the ends of said retaining means so that one of said work piece guiding means is located forwardly in said longitudinal direction of movement with respect to said retaining means during reciprocating movement of said actuating means, each of said work piece guiding means being in said longitudinal direction of movement upwardly inclined so that the outermost ends of said work piece guiding means are located directly underneath said needles and adapted to engage a work piece suspended on said suspending loops directly underneath said needles so that said work piece is guided by said inclined guiding means downwardly away from said needles and out of the path of said retaining means; and spring means urging said work piece guiding means into engagement with said needle comb.

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