

W. W. CHACE.
METHOD OF KNITTING.
APPLICATION FILED DEC. 22, 1915.

1,201,803.

Patented Oct. 17, 1916.

Fig. 1.

Fig. 2.

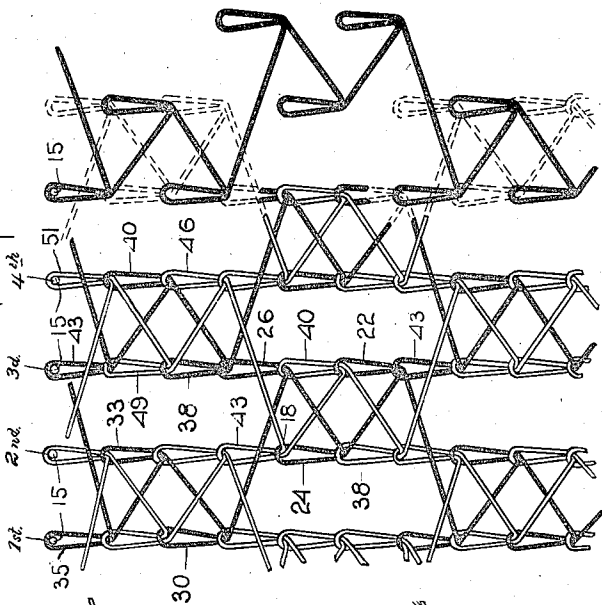
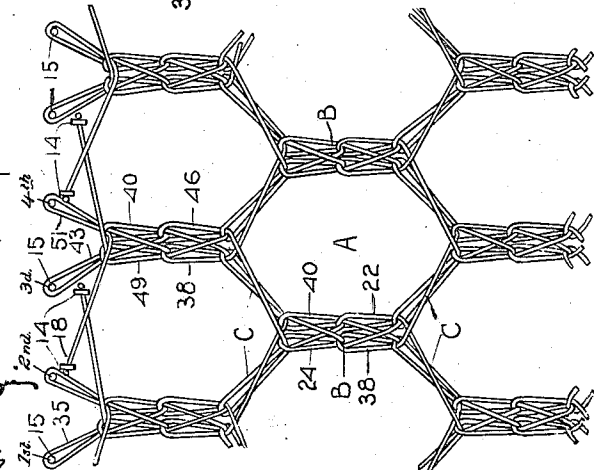


Fig. 3.

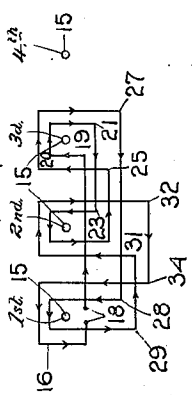


Fig. 4.

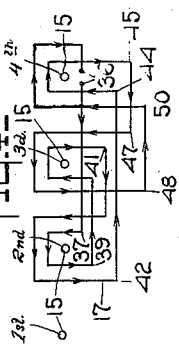
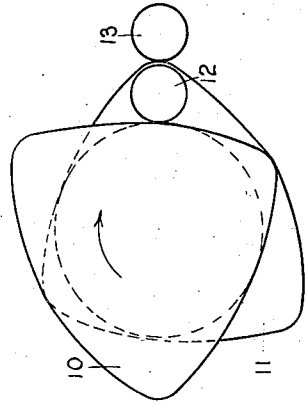


Fig. 5.



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METHOD OF KNITTING.

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To all whom it may concern:

Be it known that I, WILLIAM WALL CHACE, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Method of Knitting, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: To control the guide of a knitting machine for localizing the weaving thereof for forming designs having alternate filled and blank spaces; and to form fabric incorporating the design by a knitting machine and by a continuous operation thereof.

Drawings.—Figure 1 is a detail view showing on a magnified scale, a fragment of net constructed in accordance with the present invention; Fig. 2 is a view illustrating the arrangement of the interwoven threads, said threads being spread to facilitate the tracing of the same; Figs. 3 and 4 are diagrammatic views illustrating the relative movement of the guide bars employed for laying the threads for the fabric; Fig. 5 is a detail view showing bearing members of guide bars employed by machines when operating pursuant to the present invention, and operating cams for shifting the bars when laying the threads guided thereby.

Description.—The method herein disclosed is employed by me chiefly in the manufacture of net, and particularly net wherein the threads are laid to produce a honey-comb as indicated on an enlarged scale in Fig. 1 of the drawings, where the open spaces A are formed by laterally disposed woven bodies B, which are connected diagonally by relatively thinner connecting sections C. When constructing this fabric, I preferably employ a machine wherein two guide bars are used, which are laterally shifted and advanced in a horizontal plane, moving in relatively opposite directions, to form similar evolutions, as indicated by the diagrams shown in Figs. 3 and 4. The method may be performed by hand. I prefer, however, to employ a machine wherein the cams move the guide bars laterally, the said guide bars having rollers such as 12 and 13, which ride the edge surfaces of the cams 10 and 11. The guide bars are of conventional construction.

It has been deemed unnecessary to show the guide bars in the present drawings. Each guide bar has, however, pendent therefrom, a series of fingers 14, shown in Fig. 1 of the drawings. The thread to be knitted is delivered to the fingers 14 from a number of sources of supply, each source being independent of all other sources. The fingers 14 are caused to move in the path of needles 15, which are conventionally arranged and reciprocated vertically. These needles are furnished with a suitable crooked end, the opening of the crook being adapted to pass over the thread furnished by the fingers and to engage the same in the downward movement of the needles to draw the loops, as shown best in Fig. 2 of the drawings. As in the usual knitting machine, each loop is drawn through another loop, the resultant fabric being a multiplicity of interwoven loops.

When operating the guide bars connected with the rollers 12 and 13, and carrying each a series of fingers 14, they are moved around the needles 15 in the paths indicated by the lines designated by the numerals 16 and 17, and shown in Figs. 3 and 4, respectively. In each of said figures, the line designated portrays the movement of one finger and the lay of the thread carried thereby for operation upon by three needles 15. The result of the movements of the opposite bars in the paths indicated in the presence of the coöperating needles 15, produces the weave shown in Figs. 2 and 1, respectively.

To facilitate the description of the method herein disclosed, the needles 15, which, it is understood, are arranged in groups of four, with which groups two fingers 14 coöperate. In Figs. 3 and 4 the numerals 15 indicate identical needles. The lines 16 and 17, however, indicate the paths of and thread laid by the opposed bars and the fingers 14 thereon.

All the stitches forming the particular design herein described are identical, the bars and fingers 14 thereof moving synchronously. Thus from an initial station, designated by the numeral 18 in the drawings, a thread is carried from a position juxtaposed to the first needle of one group, past the middle needle of the same group, to a station juxtaposed to the third needle of the group, and to a point designated by the numeral 19. The guide bar is now shifted,

so that the finger 14 and thread carried thereby pass between the middle and third needles of the group, to a position indicated by the numeral 20. From this position, the finger
 5 is moved back of the third needle and around the same to the front and to the position designated by the numeral 21. It will now be observed that the thread at the back of the third needle is in the path of the crook
 10 of the said needle, and that at this moment the needle is lowered, carrying down the loop 22, as seen in Fig. 2 of the drawings.

To resume the path of the needle as shown in Fig. 3, the thread is now carried from
 15 the position 21, through the station 23 juxtaposed to the middle needle of the group. At this point, the bar is swung back and around the middle needle to deposit at the back thereof, the thread which this needle en-
 20 gages to form a loop 24. When the guide bar and the finger 14 is brought forward, it is again returned to the position 25 juxtaposed to the third needle of the group, from which position it is again returned back of
 25 and around the said third needle, which co-operating therewith forms a loop 26. The finger after coöperating in the formation of the loop 26, returns to the forward position designated by the numeral 27, from which it
 30 moves to the position in front of and juxtaposed to the first of the group of needles, said position being indicated by the numeral 28. From this position, the finger is carried between the first and second needles of the
 35 group, and around the first needle to a forward position 29, permitting the first needle to form the loop 30. From the position 29, the finger moves to the position 31 between the first and second needles, and is carried
 40 between the said first and second needles and back of and around the second needle, and brought forward to a position 32, permitting said second needle to form the loop 33. The finger and thread is then laterally advanced
 45 to the position 34 between the first and second needles to be moved therebetween back of and around the first needle to the initial station 18, permitting the said first needle to form the loop 35.

50 The above describes the complete cycle of one finger 14 and thread carried thereby in the presence of three needles. In Fig. 2 of the drawings, it will be noted that the black thread at the left of said figure has been
 55 employed to illustrate the movement and lay of the thread and the loops forming the net. The white thread shown in the said figure, is laid by the finger 14 on an opposite guide bar, and the movement of one finger and the
 60 thread carried thereby on said guide bar is shown in Fig. 4 of the drawings.

In Fig. 4, the initial station selected is designated by the numeral 36, juxtaposed to the fourth needle, and which corresponds in
 65 point of time with the station 18 in Fig. 3.

From this station 36, the finger on the second guide bar moves laterally in a direction opposite that formerly described until the finger is brought to the station 37 in front
 70 of the third of the above denoted group of needles. From this position, the finger of the second guide bar passes behind and around the second of the group of needles to permit the same to form the loop 38. The second finger passes from the forward position
 75 indicated as 39, to the position between the second and third needles, from which it is carried back of the third needle and around the same to permit it to form the loop 40. The needle is then brought to the
 80 forward position 41.

It should now be noted that the loop 22 formed by the coöperation of the third needle with the finger of the first-mentioned bar, and the loop 38 formed by the second
 85 needle with the finger of the second-mentioned bar, were formed simultaneously, and that when the loop 24 formed by the coöperation of the finger of the first bar and the second needle, and the loop 40 formed by
 90 the third needle and the finger of the second bar, were perfected, they were drawn through the previously formed loops 22 and 38.

From the position 41, the finger of the
 95 second bar moves to a position between the second and third needles, and is past back of and around the second needle and brought forward to a position indicated by the numeral 42. The first needle then forms the
 100 loop 43, which, it will be noted, by reference to Fig. 2 of the drawings, is drawn through the formerly perfected loop 24. From the position 42, the finger of the second bar is now carried to a position 44 between the
 105 third and fourth needles of the group from whence it is moved back of and around the fourth needle, and brought forward to a position indicated by the numeral 45, which permits the fourth needle to form a loop 46.
 110 From the position 45, the finger of the second bar advances to a position 47 between the third and fourth needles, from whence it is carried back of and around the third needle and brought forward to a position
 115 indicated by the numeral 48. Laying the thread at the back of the third needle permits the same to form a loop 49. From the position 48, the finger moves to a position 50, between the third and fourth needles, from
 120 whence it is carried back of and about the fourth needle and brought forward to the final position, thereby forming the loop 51.

It will be noted that the loops 49 and 51 were drawn through the loops 38 and 40,
 125 respectively. It should also be noted that in the above description and operation of both guide bars and their respective fingers, the same has been continued past the complete cycle to form the loops 35 and 51, re- 130

spectively, which loops in reality form the initial loops of a second cycle of said bars and fingers.

5 It will also be noted that the loops 43 and 46, and 26 and 30, are connected by relatively long threads or stitches, which, when the fabric is completed, constitute, in part, the connecting sections C. The loops 38, 46, 49 and 40 form the filled sections B of the
10 completed fabric, and the open spaces A are the blanks between the said connecting sections and filled sections.

Claim:

A process of knitting consisting in first

forming a pair of chains of stitches by the 15 employment of a pair of yarns, each yarn forming alternate stitches in the respective chains of said pair, then shifting said yarns from the last formed stitch of each chain laterally to cross said other chain of the pair 20 and thereafter similarly forming other pairs of chains embodying stitches in continuation of the last named chain of said pair and of said laterally shifted yarn.

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Witnesses:

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