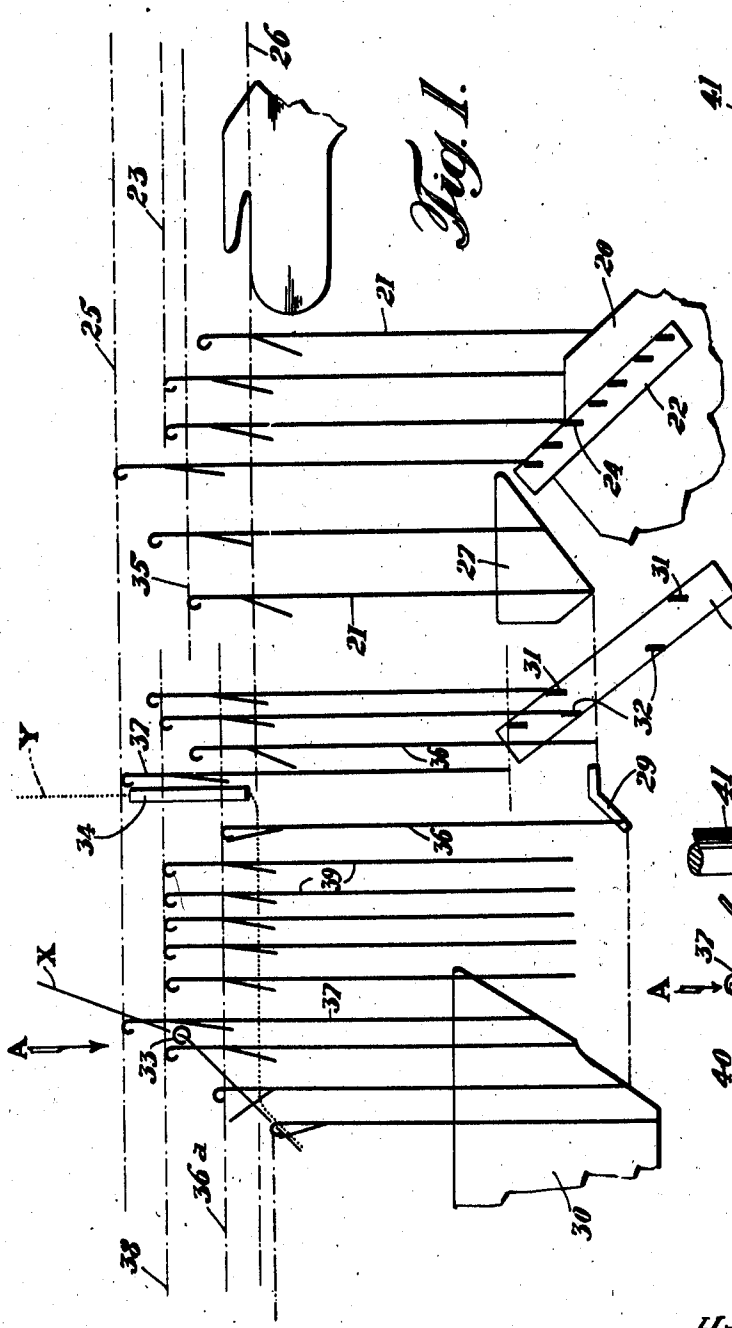
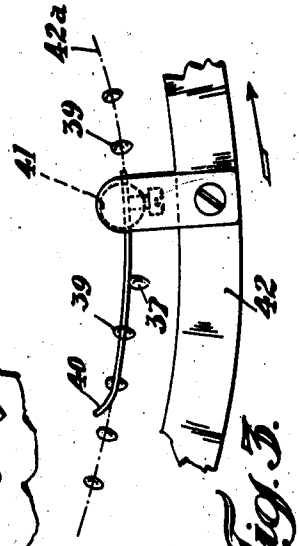
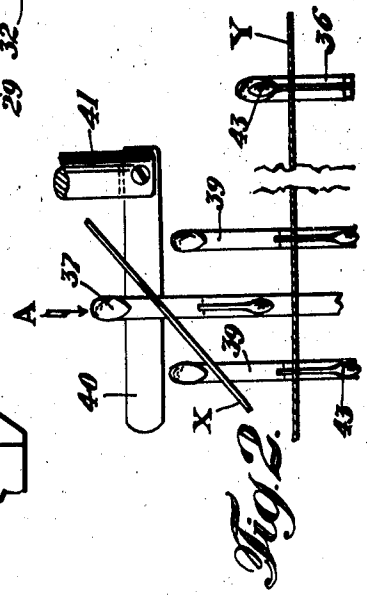
Feb. 24, 1942. H. AGULNEK ET AL 2,273,811

METHOD OF KNITTING AND MACHINE THEREFOR

Original Filed Jan. 13, 1941 4 Sheets-Sheet 1







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Fig. 4.

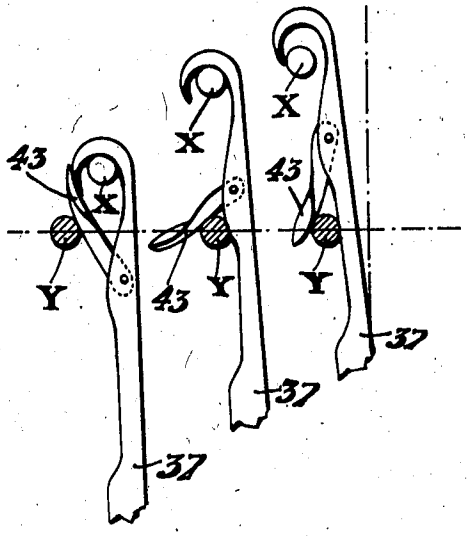
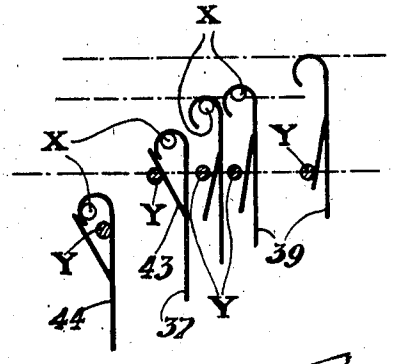


Fig. 5.



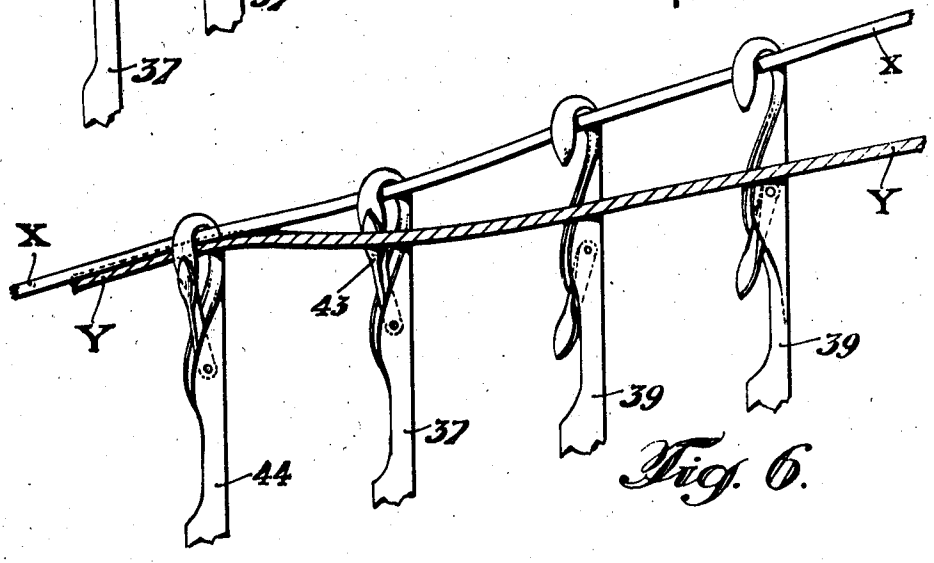


Fig. 6.

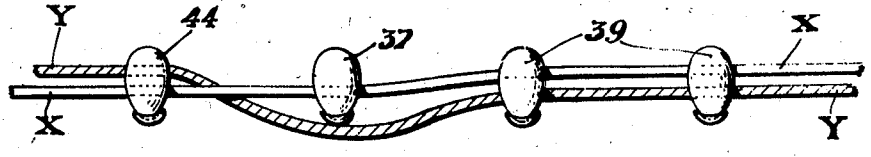


Fig. 7.

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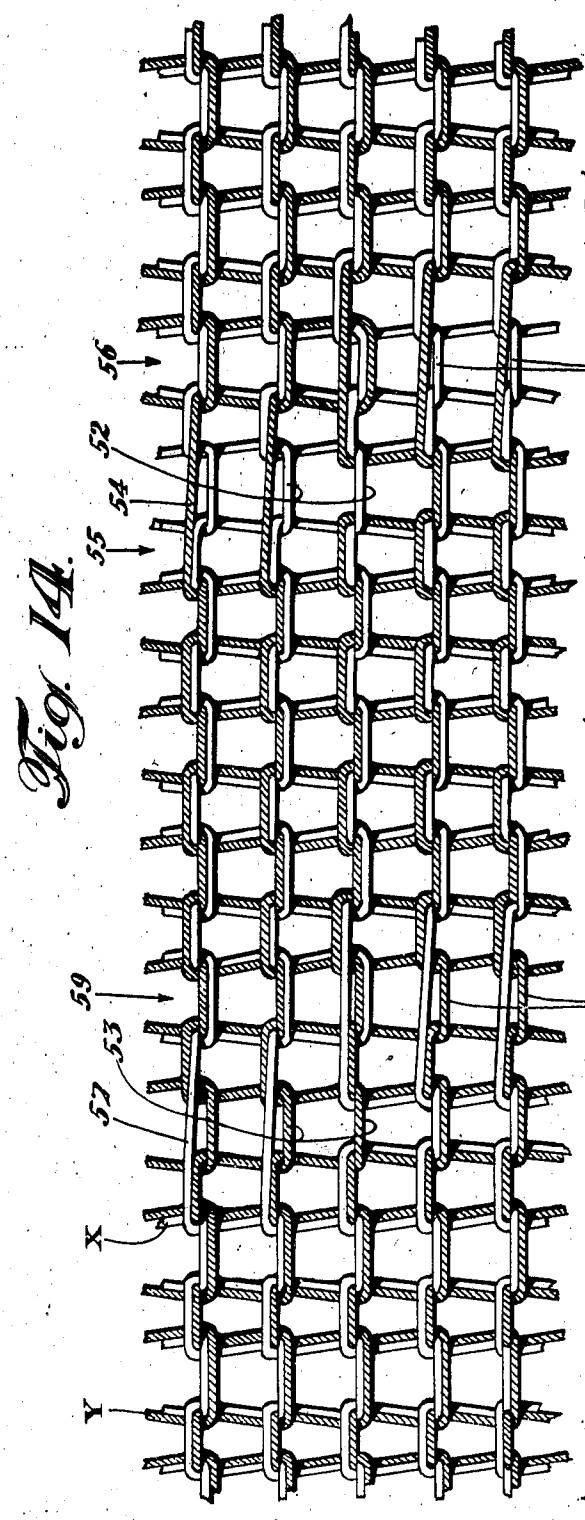


Fig. 14.

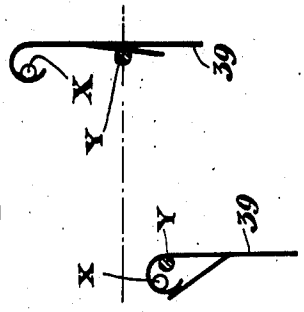


Fig. 11.



Fig. 9.

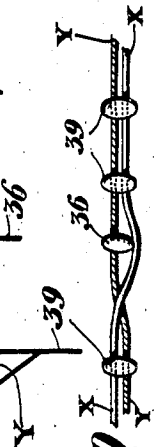


Fig. 10.

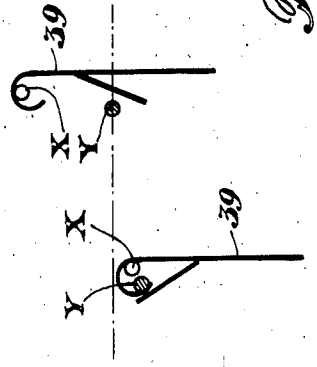


Fig. 8.

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Fig. 12.

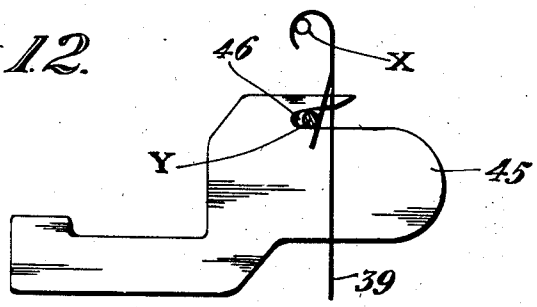


Fig. 13.

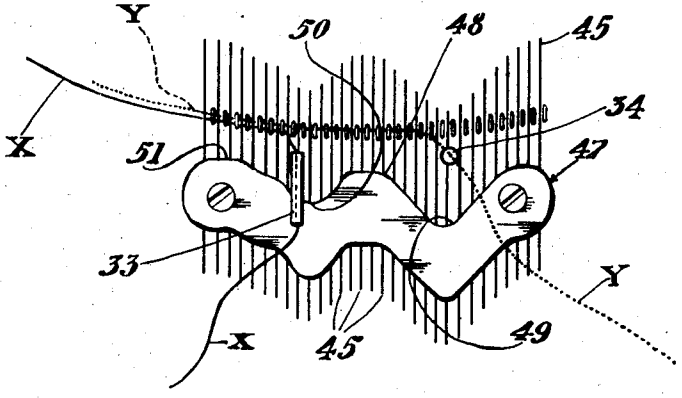
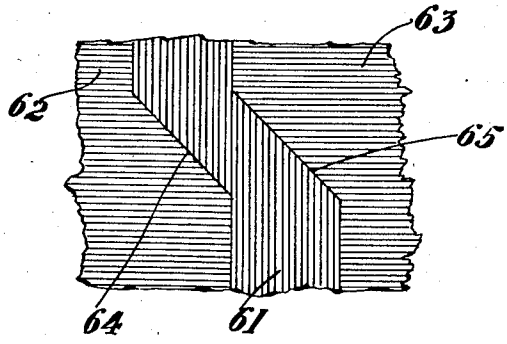


Fig. 15.



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Patented Feb. 24, 1942 2,273,811

UNITED STATES PATENT OFFICE

2,273,811

METHOD OF KNITTING AND MACHINE THEREFOR

Harry Agulnek and Lester Mishcon, Brooklyn, N. Y., assignors to Samuel Mishcon, doing business as Supreme Knitting Machine Co., Brooklyn, N. Y.

Original application January 13, 1941, Serial No. 374,220. Divided and this application August 2, 1941, Serial No. 405,164

14 Claims. (Cl. 66—50)

This invention relates to a method and apparatus for making knitted fabrics having design effects thereon, and particularly to the production of reversely plated fabrics, this being a division of our application filed January 13, 1941, Serial No. 374,220.

Reversals of the plating yarns in knitting operations have been heretofore effected by mechanisms adapted either to produce reversing movements of the yarn carriers, or to cause a displacement of selected needles by flexing or other means for bringing about a reversal of the positions of the yarns in the hooks of the needles before casting off. In most of the presently known methods commonly employed for this purpose, special tensioning means must be employed to keep the yarns in condition for enabling the reversing operation to be properly effectuated; and in all of the devices employed for reverse plating all the needles must at all times be caused to take both or all the yarns operatively fed in plated relation. It has been frequently found that with these conventional methods heretofore used to produce reverse plating effects, not only were the devices comparatively intricate in structure, but they also at times produced fabric with an indefinite line of demarcation between adjacent plated areas as a result of overlapping of the contiguous marginal wales of the two areas.

It is primarily within the contemplation of our invention to enable reverse plating to be accomplished without any of the aforesaid shortcomings and by simple means readily adapted for use in conventional knitting machines without the necessity of any material changes therein.

It is an important object of our invention to simplify the production of reverse plated fabrics, as well as the machines for producing them, by causing a deflection of relatively few of the knitting needles, and in such manner as to cause a reversal of the position of the yarn within the plating needles until a return reversal is effected by an extremely simple expedient.

It is another object of this invention to produce a patterned fabric by reverse plating in such manner as to effect a sharp line of demarcation between differently colored or textured areas. We accomplish this objective by causing certain needles, hereinafter called "reversing" needles, to miss one of the two yarns fed in plated relation, so that the wales at the line of demarcation between two adjacent design areas of the fabric contain only a single yarn, whereas the wales in the rest of the knitted and design areas contain two yarns. By this means not only is the separating line between design areas characterized by a single color, but also by a distinct texture or surface effect because the wales of such line of demarcation have less body than the rest of the fabric. We have found that by this method of knitting the line of separation between two adjacent design areas is considerably more definite and accentuated than corresponding lines in fabrics produced by conventional plating methods.

And in the last-mentioned aspect of our invention, it is a further object to produce a fabric having a plurality of design areas separated by portions, analogous to the lines of demarcation above referred to, containing fewer threads than the adjacent design areas, whereby the fabric will have throughout the body thereof a plurality of areas of different thicknesses to give the effect of what is commonly known as lace cloth.

Other objects, features and advantages will appear from the drawings and the description hereinafter given.

Referring to the drawings,

Figure 1 is a diagrammatic development of a portion of a knitting machine adapted to perform the steps of producing the fabric according to our invention.

Figure 2 is an enlarged fragmentary semi-diagrammatic front view of a portion of the machine of Figure 1, showing the relation of the two yarns and the needle deflecting means in association with two reversing needles and two plating needles.

Figure 3 is a fragmentary plan view of a portion of the apparatus of Figure 2.

Figure 4 illustrates the upper reversing needle, in elevation, in three positions with respect to the two yarns.

Figure 5 is a diagrammatic elevation of a series of needles being drawn down by the stitch cam to the cast-off position, and illustrating how a reversal is effected by the action of one of the upper reversing needles.

Figure 6 is a perspective view of a series of needles, substantially similar to those of Figure 5, showing the position of the two yarns during a reversing operation.

Figure 7 is a diagrammatic plan view of the needles of Figure 6, showing the position of the two yarns during the reversing process.

Figure 8 is a diagrammatic representation of two positions of the needle next adjacent the reversing needle of Figures 5, 6 and 7, showing the reversed position of the yarn at cast-off position.

Figure 9 is a diagrammatic elevation substan-

tially similar to that of Figure 5 of another series of needles showing the action of the lower reversing needle.

Figure 10 is a diagrammatic plan view of the needles of Figure 9.

Figure 11 is a diagrammatic elevation of two positions of the needle next adjacent the reversing needle of Figures 9 and 10, showing the reversed position of the yarn at cast-off position.

Figure 12 is a diagrammatic representation of an inwardly projected sinker and adjacent needle, showing the manner in which one of the yarn strands is held in a pocket formed within the throat of the sinker and in front of the needle.

Figure 13 is a diagrammatic plan view of a fragment of the machine of Figure 1, showing the relation of the feeds for the two yarns and the sinker actuating cam.

Figure 14 is a diagrammatic representation of the fabric of our invention showing an arrangement of the stitches formed by the two plated yarns and.

Figure 15 is a representation of a portion of fabric produced according to our invention, showing a design portion thereof.

In the particular form of our apparatus for producing this invention as illustrated, a circular knitting machine of the independent, latch-needle type is employed, having a conventional cam ring coacting with a plurality of vertically movable needles. Inasmuch as the structure is well understood in the art, it is not here illustrated in detail except wherever it is deemed necessary for an understanding of this invention. Operatively associated with the machine are a plurality of needle elevating and depressing means for raising or lowering the needles to such predetermined positions as will enable the knitting steps to be effectively performed. In the preferred arrangement as illustrated, an approach cam **20** is employed to elevate coacting needles **21** to a level where such needles will be operatively received by the pattern wheel **22**, the preferred arrangement being such that the hooks of the needles will be elevated by cam **20** to tuck level **23**. It is understood, of course, that the wheel **22** is adapted to selectively elevate coacting needles and let others pass therethrough in conventional manner. In the design illustrated, however, all the slots of the wheel are shown filled with jacks **24** so as to elevate all the needles to latch-clearing level **25** with respect to a sinker level **26**. Following the wheel **22** are, in succession, the depressing cam **27**, a special type of selector wheel **28**, a separating cam **29** and a stitch cam **30**, the operative coactive employment of which will hereinafter be fully described. It should, however, at this time be noted that said wheel **28** is preferably substantially of the type described in Patent No. 2,055,598 wherein there are two sets of jacks, the upper jacks **31** for elevating coacting needles to a latch-clearing position for taking only one yarn, and the lower jacks **32** for elevating coacting needles to an intermediate level for taking two yarns in plating relation, as will hereinafter appear. The separating cam **29** is preferably, although not necessarily, of the type described in Patent No. 2,006,821.

The two yarns X and Y are fed in plating relation by means of guides **33** and **34**, respectively. It will be observed that guide **34** feeds yarn Y along a substantially horizontal path at the sinker level, and that guide **33** directs yarn X downwardly above yarn Y and at an angle with respect thereto, the two yarns being fed in adjacent relation within the hooks of the needles being drawn down for loop drawing by stitch cam **30**. In the preferred manner of practicing our invention, the needles leaving selector wheel **22** are drawn down by cam **27** to a level **35** preferably slightly below tuck level. Thereafter the needles **21** encounter the two-level selector wheel **28**. Some of the needles **36** pass through said wheel and are drawn down by separator **29** to a level **36a** slightly above sinker level, the position being such that each needle **36** will be in a position to take yarn Y, but will be below the level for taking yarn X, and will be sufficiently low to enable the previously formed stitches over the shanks of needles **36** (not shown) to close the latch of each of these needles, as is indicated in Figure 1. Certain of the needles leaving cam **27** are elevated by the upper jacks **31** of wheel **28** to latch-clearing level, as aforesaid, such needles being identified by the reference number **37**, these needles being elevated sufficiently high to take yarn X only, the latch being above the sinker level and being entirely clear of any portion of yarn Y. Certain other needles leaving cam **27** are elevated by low jacks **32** of wheel **28** to the intermediate level **38**, these needles being identified by the reference numeral **39**. It will be observed that needles **39** are at such a level as to enable them to take both yarns X and Y, the latter yarn being received across the open latches of the needles, whereas the former is received thereabove in the region of the hooks. For purposes of convenience, the needles taking both yarns, to wit, needles **39**, are referred to as "plating" needles, whereas needles **36** are referred to as "lower reversing" needles and needles **37** as "upper reversing" needles.

After a selected upper reversing needle **37** takes yarn X, it is necessary to cause this needle, during its downward course to loop-drawing position, to miss yarn Y and hold only yarn X within its hook. One way of doing this would be to force the yarn Y, by the action of a sinker such as **45** of Figure 12, against the shank of the needle **37** below its latch when it is in its raised position shown in Figure 2. As the latch in its fully open position is, or can be made to be, slightly inclined with respect to the shank of the needle, the lower tip of the latch will be spaced sufficiently from the shank to permit the yarn Y to enter between the latch and shank, and thereby raise the latch and ride thereover, to miss the hook as the needle is being drawn down. Another method of doing this is to deflect the needle **37** forwardly by suitable means, thereby bringing the shank of the needle against the yarn Y to produce the same result, that is, to cause the needle **37** to miss the yarn Y and hold only the yarn X within its hook. This action begins substantially in the region designated by the arrow A. By referring to Figures 2 and 3 it will be seen that the upper reversing needle **37** is engaged by the preferably resilient deflector **40** supported by the bracket **41** affixed to sinker ring **42**. The deflector **40** is preferably curved a sufficient amount over a predetermined distance so as to maintain the upper reversing needles **37** in their projected positions until they reach a predetermined position in the region of the sinker level, as will appear from the description hereinafter given. It will be observed from Figure 3 that each needle **37** is displaced forwardly or outwardly from the cylinder, out of its

normal position along the circular arc **42***a* representing the normal arcuate position of the needles about the cylinder.

When needle **37** is deflected forwardly (see Figure 4), the shank of the needle will be brought towards yarn Y which is disposed below the latch **43**. As the needle is drawn down by the stitch cam, the said yarn, remaining at sinker level **26**, will engage and cause said latch **43** to close, and thereafter, during the continued downward movement of the needle, the said yarn Y will ride over the closed latch, missing the hook completely, as indicated in the extreme left position of Figure 4. It is important to observe that of the two yarns the lower yarn Y is normally fed closer to the cylinder (or to the shank of the needle), whereas the upper yarn X is fed so that it will be somewhat farther removed from the cylinder. When the needles are subsequently brought down towards the cast-off position, under normal conditions with both yarns in the hook, as shown in needle **44** of Figure 5, that position is maintained, whereby the yarn Y will appear on the face of the fabric and yarn X on the back thereof.

But when the yarn Y is caused to miss the hook and ride over the latch **43** of needle **37**, as indicated in the extreme left position of Figure 4, it is obvious that that portion of yarn Y within the next following plating needle **39** will also be urged forwardly, causing a reversal of the position of the two yarns therein.

The above-referred-to reversing action will more clearly appear from an examination of Figures 5 to 8, inclusive. In Figure 5 the upper reversing needle **37** is shown on its downward path (being brought down by the stitch cam), with the yarn Y riding over the latch **43** of the needle, and with the yarn X within the hook thereof. The following plating needles **39** each contain or are adapted to contain two yarns therein. The lower yarn Y in the said following plating needles is urged forwardly to the positions indicated, in view of the fact that the said yarn Y has been moved to a forwardly position during its travel over the closed latch **43** of the reversing needle. This position is more forwardly than that of yarn X. We have found that this new relative positioning of yarns X and Y in the following plating needles **39** is maintained thereafter until positive return reversing means are brought into actual engagement with the yarn to effect a return of the two yarns to their original positions in a manner to be hereinafter described. However, until such return is definitely effectuated, the yarns maintain their reversed position, as indicated in Figure 7. As the plating needles **39** move down to the cast-off position under the influence of the stitch cam, they will assume the position shown to the left in Figure 8, which is the lowermost position of the needle shown on the right in said figure. It will be observed that in said lowermost position the yarn Y is forwardly disposed with respect to yarn X, so that upon a casting-off of this stitch in the next round, yarn X will appear at the face of the fabric, as distinguished from the normal arrangement shown in needle **44** of Figure 5 where yarn Y will appear at the face of the fabric.

In order to effect a return of the yarns to their original positions, the lower reversing needle **36** is brought into play. It will be recalled that the latch of this needle (see Figure 1) is closed after having taken yarn Y within its hook, so that as it reaches yarn X while being drawn down by the stitch cam **30**, this yarn will engage the closed latch of the needle. This is as illustrated in Figure 9 where needle **36** is shown on its downward path with yarn Y within the hook and yarn X riding over the latch. The forward position of yarn X over the latch of needle **36** urges the portions of this yarn that are disposed within the next following plating needles **37** to move forwardly, thereby bringing yarn X again into its normal forward position. This action is facilitated by the fact that only the yarn Y is engaged by the reversing needle **36**, the engagement being in the form of a downward tug thereupon, to bring it into its lower position. Thus, by referring to Figure 11, it will be seen that yarn X in the upper needle has now been brought forwardly by the action above described, so that when the needle reaches the lower position shown to the left in said figure, the two yarns are in the positions indicated, which is similar to the normal position shown in needle **44** of Figure 5. The yarns remain in this relative position until the next reversing operation takes place in the manner aforesaid.

It is thus apparent that the reversal and return to normal position may be effected in each case by a single reversing needle, although if desired a group of several such reversing needles may obviously be employed with the same force and effect. The upper reversing needle **37** is caused to miss the lower yarn Y by means of a deflection of the needle; and the lower reversing needle **36** is caused to miss the upper yarn X by virtue of the fact that its latch is closed upon reaching said yarn. In each case the non-selected yarn, or the yarn not taken by the needle, is caused to ride over the latch thereof, and thereby forced into a forwardly position. This forward movement of the non-selected yarn is transmitted to the portions thereof in the following plating needles, causing a reversal of the two yarns in the hooks thereof, so that when the needles are finally drawn to their lowermost positions by the stitch cam, the most forward yarn will in each case be the non-selected yarn.

In order to prevent the lower yarn Y from moving about uncontrollably, it is essential that such yarn be kept as closely confined towards the latches of the plating needles **39** as may be deemed reasonably necessary. And it is of particular importance to keep said lower yarn as close as possible to the shank of upper reversing needle **37** when it is in its raised position so that said yarn will underlie the needle to close the latch, and not accidentally move in front of the open latch. In this manner yarn Y remains non-selected with respect to upper reversing needle **37**, and will operatively ride over the closed latch thereof. This effect is accomplished by causing the sinkers **45** (Figure 12) to be projected inwardly towards the cylinder so as to form a pocket **46** within the throat of the sinker **45** forwardly of the needle. It will be seen that the yarn Y is disposed within the said pocket and in front of the needle, the sinker being shown in its inwardly projected position. The yarn is thus permitted a limited amount of freedom to move about and is yet maintained by this expedient in proper position beyond the region of yarn guide **33**, after which the inward slope of the sinker cam towards cast-off position helps to maintain the yarn close to the needles.

Figure 13 shows diagrammatically the camming arrangement according to best operative requirements of the apparatus of this invention.

The cam 47 mounted on the sinker ring contains an inwardly projecting portion 48 for moving the sinkers inwardly to the position of Figure 12. The portion 49 of the cam, just preceding portion 48, is recessed outwardly so as to permit guide 34 to conduct yarn Y to the needles 36 at sinker level, the sinkers being moved outwardly so as to prevent the noses thereof from intercepting the yarn portions being fed into the needles. The portion 50 of the cam subsequent to portion 48 is also recessed a sufficient amount to permit the yarn guide 33 to conduct the yarn X to the needles in proper relation to the sinker. Thereafter the inwardly disposed cam portion 51 is adapted to cause the sinkers to move to their cast-off positions.

By the method and apparatus above described, the fabric illustrated diagrammatically in Figure 14 may be produced. It will be observed that yarns X and Y are shown generally throughout the fabric in plated relation, in some courses yarn X being shown above yarn Y, and in other courses in the reverse position. It is in this manner diagrammatically illustrated that in some portions of the fabric yarn Y is on the face thereof, and in other portions yarn X is in such position. It will be observed that in those wales where the upper reversing needle 37 missed the yarn Y, stitches 52 composed only of strands of yarn X are incorporated into the fabric, whereas in those wales where the lower reversing needle 36 missed yarn X, only stitches 53 composed of strands of yarn Y are incorporated in the fabric. It will be seen that in the wales on the left of stitches 52 the yarn Y is on top, whereas on the right of stitches 52 yarn X is on top. The reversal is produced by a crossing of strand 54 of yarn Y from its upper position in wale 55 to its lower position in wale 56. The reverse is obviously true in the case of the wales flanking the stitches 53, the strand 57 of yarn X extending diagonally downwardly from the left wale to the right wale to produce the reversal.

In Figure 14 the wales containing stitches 52 and 53 constitute the lines of demarcation between adjacent design areas. Due to the selectivity of design wheel 28, the lines of demarcation may obviously be disposed in any predetermined wale. For example, wale 56 contains the single stitches 58 of yarn X, and wale 59 contains the single stitches 60 of yarn Y.

By referring to Figure 15 it will be noted that the design area 61 is separated from areas 62 and 63 by lines of demarcation 64 and 65, these lines being sharply defined not only because of color distinction, but also because of the fact that said lines of demarcation contain fewer stitches than are present in the bodies of design areas 62 and 63.

It is of course understood that other additional forms and modifications of the fabric, of the apparatus, and adaptations of the method constituting this invention can be employed beyond and in addition to those hereinabove described, all within the scope of the appended claims.

What we claim is:

1. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns in plating relation, and needle actuating means in individual association with predetermined plating needles and predetermined reversing needles for bringing them into operative engagement with said yarns, said actuating means including means operative upon said plating needles to cause them to take both of said yarns, means operative upon said reversing needles to cause them to take a selected one of said yarns, means to close the latch of each reversing needle after operatively taking its yarn, and means to hold each non-selected yarn in front of the closed latch of the coacting reversing needle, whereby said non-selected yarn in the following plating needles will be carried forwardly therein prior to the loop drawing.

2. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns in plating relation, and needle actuating means in individual association with predetermined plating needles and predetermined reversing needles for bringing them into operative engagement with said yarns, said actuating means including means operative upon predetermined groups of said plating needles to cause them to take both of said yarns, means operative upon said reversing needles to cause them to take a selected one of said yarns, needle depressing means adapted to lower all the needles to cast-off position, means to close the latch of each reversing needle after operatively taking its yarn, and means to hold each non-selected yarn against the closed latch of the coacting reversing needle being drawn down by said depressing means, whereby the non-selected yarn in the plating needles following the reversing needles will be brought to the foremost position within the hooks of the needles prior to the loop drawing.

3. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns one above the other and in plating relation, needle actuating means in individual association with predetermined plating and reversing needles for bringing them into operative engagement with said yarns, said actuating means containing needle elevating means for raising certain of the said reversing needles to an upper position for taking only the upper of said two yarns, the portion below the latch of each of said raised reversing needles when at said upper position being adjacent the lower of said two yarns, means for bringing the plating needles to a position for taking both yarns, needle depressing means for lowering all needles to cast-off position, and means for bringing each of said raised reversing needles and the said lower of said two yarns into engagement whereby, as each needle is being lowered by said depressing means, the open latch thereof will intercept said lower yarn and be closed thereby to permit the lower yarn to ride thereover and miss the hook of the needle and consequently assume a forwardly position within the hooks of the following plating needles.

4. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns one above the other and in plating relation, needle actuating means in individual association with predetermined plating and reversing needles for bringing them into operative engagement with said yarns, said actuating means containing needle elevating means for raising certain of the said reversing needles to an upper position for taking only the upper of said two yarns, and means for bringing the plating needles to a position for taking both yarns, needle depressing means for lowering all needles to cast-off position, and needle deflecting means engageable with each of said raised reversing needles while in a raised position for dis-

placing it a sufficient amount forwardly to cause the open latch thereof, as the needle is being lowered by said depressing means, to intercept the lower of said yarns, whereby said lower yarn will close said latch and ride thereover to miss the hook of the needle and consequently assume a forwardly position within the hooks of the following plating needles.

5. In a circular independent latch needle knitting machine, the combination according to claim 4, the needle deflecting means comprising cam means associated with the sinker ring and disposed substantially at the said upper position of the reversing needles and operatively engageable with coacting reversing needles to cause a forward flexing thereof.

6. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns one above the other and in plating relation, and needle actuating means in individual association with predetermined plating needles and predetermined reversing needles for bringing them into operative engagement with said yarns, said actuating means including means operative upon said plating needles to cause them to take both of said yarns, means operative upon said reversing needles to cause them to take a selected one of said yarns, means to close the latch of each reversing needle after operatively taking its yarn, sinker means operatively engageable with the lower of said yarns, means to actuate said sinker means inwardly whereby said lower yarn will be confined within the throat of adjacent sinkers and in front of the open and closed latches of coacting needles, and means to hold the upper of said yarns in front of the closed latches of coacting reversing needles, whereby the portions of said lower and upper yarns within the following plating needles will be carried forwardly therein prior to the loop drawing.

7. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns one above the other and in plating relation, needle actuating means in individual association with predetermined plating and reversing needles for bringing them into operative engagement with said yarns, said actuating means containing needle elevating means for raising certain of the said reversing needles to an upper position for taking only the upper of said two yarns, and means for bringing the plating needles to a position for taking both yarns, needle depressing means for lowering all needles to cast-off position, needle deflecting means engageable with each of said raised reversing needles while in a predetermined raised position for displacing it a sufficient amount forwardly to cause the open latch thereof, as the needle is being lowered by said depressing means, to intercept the lower of said yarns, whereby said lower yarn will close said latch and ride thereover to miss the hook of the needle and consequently assume a forwardly position within the hooks of the following plating needles, a plurality of sinkers operatively engageable with the lower of said yarns, and cam means adapted to coact with the sinkers for actuating them inwardly a predetermined amount, said cam means containing an inwardly projecting portion operatively engageable with the sinkers at the region after the lower yarn feed, whereby the said lower yarn will be confined within the throat of said sinkers and in front of the coacting needles.

8. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns one above the other and in plating relation, needle actuating means in individual association with predetermined plating and reversing needles for bringing them into operative engagement with said yarns, said actuating means containing needle depressing means for lowering certain of the said reversing needles to a position for taking only the lower of said two yarns, said position being slight above sinker level but sufficiently low to permit the previously formed stitch over the shank of each of said reversing needles to close the latch thereof, means for bringing the plating needles to a position for taking both yarns, and stitch cam means for lowering all needles to cast-off position, the closed latches of said reversing needles during their operative movement towards cast-off position engaging the upper of said yarns and consequently causing the portions of such yarn within the following plating needles to be carried forwardly.

9. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns one above the other and in plating relation, needle actuating means in individual association with predetermined plating and reversing needles for bringing them into operative engagement with said yarns, said actuating means containing needle elevating means for raising certain of the said reversing needles to an upper level for taking only the upper of said two yarns, means for bringing the plating needles to an intermediate level for taking both of said yarns, and means for bringing certain other of said reversing needles to a lower level for taking only the lower of said two yarns; needle depressing means for lowering all needles to cast-off position; means to close the latch of each reversing needle after operatively taking its yarn; and means to hold the non-selected yarn against the closed latches of coacting reversing needles, whereby the respective non-selected yarns will be carried forwardly within the following plating needles.

10. In an independent needle knitting machine, reverse plating means comprising means for simultaneously feeding two yarns in plating relation, one of said yarns being fed substantially along sinker level and the other a predetermined distance thereabove, needle actuating means in individual association with predetermined plating and reversing needles for bringing them into operative engagement with said yarns, said actuating means containing needle elevating means for raising certain of the said reversing needles to a latch-clearing position for taking the upper of said two yarns, means for bringing the plating needles to an intermediate level for taking both of said yarns, and means for bringing certain other of said reversing needles to slightly above sinker level for taking the lower of said yarns and causing the previously formed stitches over said needles to close the latches thereof; needle depressing means for lowering all needles to cast-off position; needle deflecting means engageable with each of the said reversing needles raised to latch-clearing position for deflecting it, while in a raised position, a sufficient amount forwardly to cause the open latch thereof, as the needle is being lowered by said depressing means, to intercept the lower of said yarns, whereby said lower yarn will close said latch and ride thereover and assume a forwardly position within the following plating needles; the said reversing needles

which contain only the lower yarn engaging, during their movement to cast-off position, the upper of said yarns with their closed latches, and consequently causing the portions of such yarn within the following plating needles to assume a forwardly position.

11. In a method of knitting reversely plated fabric upon a series of independently movable needles, the steps of feeding to certain of the needles a pair of yarns in plating relation, alternately feeding first to certain other needles a selected one of said yarns and then to certain other of the needles the other of said yarns, actuating each non-selected yarn forwardly during the knitting of a course of stitches to cause the portions of said non-selected yarn within the following adjacent needles be correspondingly carried forwardly, thereby exchanging positions with the other yarn in each of said following needles, and moving all the needles to cast-off position.

12. In a method of knitting reversely plated fabric upon a series of independently movable latch needles, the steps of feeding to certain of the needles a pair of yarns in plating relation, feeding to certain other predetermined needles a selected one of each of said yarns, closing the latches of each of said predetermined needles after having received its selected yarn, bringing the non-selected yarn into engagement with the closed latch of each of the said predetermined needles coacting therewith during the knitting of a course of stitches, whereby said non-selected yarn will ride over the latch of each of said needles and be actuated forwardly out of its normal path to cause the portion thereof in the following needle to be correspondingly actuated, and moving all the needles to cast-off position.

13. In a method of knitting reversely plated fabric upon a series of independently movable latch needles, the steps of feeding to certain of the needles a pair of yarns one above the other and in plating relation, elevating during the knitting of a course of stitches at least a predetermined one of certain other needles to a level for taking the upper of said yarns but above the level of the lower yarn, lowering all the needles to cast-off position, deflecting said predetermined needle out of its normal position while being so lowered, whereby it will take only said upper yarn and miss the lower yarn, and bringing the lower yarn into engagement with the latch of said deflected needle during its downward travel, whereby the lower yarn will be caused to close the latch and ride thereover, thereby being moved forwardly from its normal position to cause the portion thereof in the next adjacent needle to be correspondingly moved forwardly.

14. In a method of knitting reversely plated fabric upon a series of independently movable latch needles, the steps of feeding to certain of the needles a pair of yarns one above the other and in plating relation, bringing at least a predetermined one of certain other needles to a position above sinker level for taking the lower of said yarns but sufficiently low to cause the previously formed stitches over the shank of said predetermined needle to close the latch thereof, moving all the needles towards cast-off position, and bringing the closed latch of said predetermined needle into engagement with the upper of said yarns, thereby moving it forwardly from its normal position to cause the portion thereof in the next adjacent needle to be correspondingly moved forwardly.

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