MECHANISM FOR CONTROLLING KNITTING NEEDLES IN PLATING RELATIONS

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This invention relates to mechanism for controlling knitting needles in plating relation, and particularly to means for moving outwardly predetermined needles when normal plating is to occur thereat.

In order that the principle of the invention may be readily understood, we have disclosed one embodiment of the invention as well as certain instrumentalities whereby the invention may be practised.

In the drawings—

Fig. 1 is a plan view of the sinker or web holder bed ring and showing in horizontal section the cams of the sinker cam ring, the top plate of said ring being removed;

Fig. 2 is a detail in plan of the sinker ring and certain parts in the grooves thereof;

Fig. 3 is a vertical transverse section upon the line 3-3 of Fig. 1 and looking in the direction of the arrows in said figure, the needle being shown in its inner position; and

Fig. 4 is a perspective view of certain instrumentalities employed with this form of our invention.

In the patent to Robert H. Lawson, No. 1,605,885, dated November 2, 1926, there are disclosed means for effecting reverse plating by the action of casting off mechanism, whereby lengthwise extending stripes may be formed in hosiery or other knitted fabrics.

In the patent to Robert H. Lawson, No. 1,605,886, dated November 2, 1926, there are disclosed means for effecting reverse plating through the action of instrumentalities, the transverse movements whereof are selectively governed, whereby a great variety of patterns may be provided.

In the present application means are disclosed particularly constituting improvements upon or adapted to be used with the mechanism shown in said Patent No. 1,605,886, but which may be used with mechanism such as shown in said Patent No. 1,605,885. The mechanism here shown is also of general application.

The web holder bed ring is indicated at 1, it having radial or transversely extending grooves 2, for receiving the regular web holders or sinkers indicated at 3 in the several figures and also for receiving the special instrumentalities indicated at 4 in said figures. The sinker cam ring, the top plate whereof has been removed from Fig. 1, is equipped with a series of cams for providing different pathways, in the inner one 6 whereof the regular web holders are guided by their butts 7 and in the two outer ones 8, 9 whereof the special instrumentalities 4 are guided by their butts 10 depending upon whether normal or reverse plating is being effected. For reverse plating upon the needle corresponding to any specified special instrumentality, the butt 10 of that special instrumentality is in the innermost groove 8 of said two outer pathways, and for normal plating the butt 10 of that special instrumentality is in the outer pathway 9.

Between the pathways 8 and 9 is a cam 11 of general segmental form, and between the pathways 6 and 8 is a cam 12 also of general segmental form. The said cams 11 and 12 are sufficiently spaced from each other to receive the butts 10 of the special instrumentalities when the same have been directed thereto in any suitable manner, as, for example, by selective means such as shown in the Lawson Patent No. 1,605,886. It will be noted that the special instrumentalities 4 are of greater length than the regular sinkers or web holders 3, and also that the outer ends of butts of the special instrumentalities 4 are thickened so as to occupy the entire width of each groove 2. The segmental cam 11 is provided with an inwardly sloping or inwardly extending end part 14, the purpose of which is to move the special instrumentality radially inward at an earlier point circumferentially considered, or, in other words, at an earlier point in the stitch forming operation than the regular web holders are moved inward at or near the casting off point. The purpose of this action is substantially that described in said Lawson Patent No. 1,605,885. Slightly circumferentially beyond the point where the special instrumentalities are moved inward, that is, to the left thereof viewing Fig. 1, the inner edge of the cam 9 is sloped inward, as indicated at 15, such slope terminating in the point 16 circumferentially beyond which the edge of the cam 9 slopes again outwardly as indicated at 17. The purpose of the slope 15 up to the point 16 is to force the regular web holders inwardly in the regular stitch forming operation.
At an earlier point circumferentially considered than the inwardly extending end part 14, the cam 11 is provided at its outer edge with an enlargement or radially thickened cam of substantial circumferential extent indicated at 18 in Fig. 1. The purpose of this enlargement is to cause the special instrumentality 4 to be moved slightly further outwardly by engagement with the butt end thereof.

Assuming that the mechanism is used with that type of selective means shown in the Lawson Patent No. 1,605,596, the butts 10 of those special instrumentalities 4, which are selected for reverse plating, ride in the pathway 8, the other special instrumentalities 4, being those at which normal plating is to be effected, remaining in the outermost pathway 9. In the continued movement of the parts, the said selected special instrumentalities 4 are projected inward by the inclined edge 13 and very shortly thereafter the regular web holders or sinkers 3, whose butts 7 ride in the inner pathway 6, are also projected inward. The mechanism disclosed constitutes one type of means for effecting normal and reverse plating and is selected merely for purposes of illustration of means which we hereby term primary means for effecting normal and reverse plating.

In accordance with our invention, we provide means for effecting deflection of the needles at the hook end and particularly for outwardly deflecting those needles upon which normal plating is to be effected. While we have shown regular web holders or sinkers 3 and also certain special instrumentalities 4, it is clearly to be understood that our invention is not limited to mechanism wherein special instrumentalities are employed.

The needle grooves 19 are here shown as of usual depth, but our invention is not limited in this respect. While the needle movement may be effected in any suitable manner, it is here shown as effected by a hook or bent part 20 formed upon each of the special instrumentalities 4, as shown most clearly in Fig. 4. While the hook 20 or like formation might be employed upon a special instrumentality, which itself is shaped to cooperate in effecting reverse plating at desired times, it will be evident that the special instrumentality 4 is not provided with a formation to cooperate in effecting reverse plating. In other words, the construction of Fig. 4 is particularly intended for use where reverse plating occurs in some manner or through some instrumentalities at certain needles, and it is desired to change from reverse plating to normal plating. The special instrumentality 4 is provided with the usual butt 10, and the latter engages the edge 18 shown in Fig. 1 for the purpose of effecting outward movement of the needles against the tension of the spring band or bands 22. The needle represented at 23 is shown as provided with a butt 24.

It is clearly to be understood that our invention may be employed in mechanisms where the radial grooves of the web holder bed rings receive only regular web holders or sinkers. In other words, our invention is not limited to any particular means for effecting the outward deflection of the needles. The outward deflection of the needles is, however, for the purpose of effecting change from reverse plating to normal plating relation. An important object is to secure a sharp or well defined change from reverse to normal plating.

Having thus described one illustrative embodiment of our invention, we desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

1. In a knitting machine having primary means for effecting normal and reverse plating, a series of independent needles and operating means therefor, to which needles two threads are adapted to be fed in a plating relation, regular sinkers or web holders for the needles respectively, and means for deflecting selected needles at the thread engaging end, with continued feeding of both threads to the selectively deflected needles, whereby auxiliary means is provided for insuring a change from reverse plating relation to normal plating relation of said threads.

2. In a knitting machine having primary means for effecting normal and reverse plating, a series of independent needles and operating means therefor, to which needles two threads are adapted to be fed in a plating relation, regular sinkers or web holders for the needles respectively, and means for deflecting selected needles at the thread engaging end, in the vicinity of the knitting point and prior to completion of the stitches, with continued feeding of both threads to the selectively deflected needles, whereby auxiliary means is provided for insuring a change from reverse plating relation to normal plating relation of said threads.

3. In a knitting machine having primary means for effecting normal and reverse plating, a series of independent needles and operating means therefor, to which needles two threads are adapted to be fed in a plating relation, regular sinkers or web holders for the needles respectively, and means for deflecting outwardly selected needles at the thread engaging end, with continued feeding of both threads to the selectively deflected needles, whereby auxiliary means is provided for insuring a change from reverse plating relation to normal plating relation of said threads.

4. In a knitting machine having primary
means for effecting normal and reverse plating, a series of independent needles and operating means therefor, to which needles two threads are adapted to be fed in a plating relation, regular sinkers or web holders for the needles respectively, and means for deflecting outwardly selected needles at the thread engaging end in the vicinity of the knitting point and prior to completion of the stitches, with continued feeding of both threads to the selectively deflected needles, whereby auxiliary means is provided for insuring a change from reverse plating relation to normal plating relation of said threads.

5. In a circular knitting machine having primary means for effecting normal and reverse plating, a circular series of independent needles to which two threads are adapted to be fed in a plating relation, movable instrumentality for the needles respectively to engage the same and deflect them thereby co-operating to insure a change from a reverse plating relation to a normal plating relation of the threads, and sinkers or web holders for the needles respectively.

6. In a circular knitting machine having primary means for effecting normal and reverse plating, a circular series of independent needles to which two threads are adapted to be fed in a plating relation, movable instrumentality for the needles respectively to engage the same in the vicinity of the knitting point and prior to completion of the stitches and deflect the needles thereby co-operating to insure a change from a reverse plating relation to a normal plating relation of the threads, and sinkers or web holders for the needles respectively.

7. In a knitting machine having primary means for effecting normal and reverse plating and having a series of independent needles and having means to feed two threads thereto in a plating relation, a series of instrumentality one for each needle and movable in and out with respect to the said needle series, and means associated with each of said instrumentality and the corresponding needle to deflect said needle outwardly at the thread engaging end, whereby auxiliary means is provided for insuring a change from reverse plating relation to normal plating relation of said threads.

8. In a knitting machine having primary means for effecting normal and reverse plating upon a series of independent needles and having means to feed two threads thereto in plating relation, a series of instrumentality one for each needle and movable in and out in knitting relation, and means associated with each of said instrumentality and the corresponding needle to deflect said needle outwardly at the thread engaging end in the vicinity of the knitting point and prior to completion of the stitches and cooperating to insure a change in plating relation of such threads with continued feeding of both threads in the selectively deflected needles.

9. In a knitting machine having primary means for effecting normal and reverse plating upon a series of independent needles and having means to feed two threads thereto in plating relation, a series of instrumentality one for each needle and movable in and out in knitting relation, and means associated with each of said instrumentality and the corresponding needle to deflect said needle outwardly at the thread engaging end, and cooperating to insure a change in plating relation of such threads with continued feeding of both threads in the selectively deflected needles.

10. In a knitting machine having primary means for effecting normal and reverse plating and having a series of independent needles and having means to feed two threads thereto in a plating relation, a series of instrumentality one for each needle and movable in and out with respect to the said needle series, each of said instrumentality having a formation to engage the corresponding needle, thereby to move the same outwardly when such instrumentality is moved outwardly, whereby auxiliary means is provided for insuring a change from reverse plating relation to normal plating relation of said threads.

11. In a knitting machine having primary means for effecting normal and reverse plating and having a series of independent needles and having means to feed two threads thereto in a plating relation, a series of instrumentality one for each needle and movable in and out with respect to the said needle series, each of said instrumentality having a hook to engage the back of the needle and thereby to move the needle outwardly as said instrumentality is moved outwardly, whereby auxiliary means is provided for insuring a change from reverse plating relation to normal plating relation of said threads.

12. In a knitting machine having primary means for effecting normal and reverse plating and having a series of independent needles and having means to feed two threads thereto in a plating relation, a series of sinkers or web holders one for each needle, and a series of instrumentality one for each needle, and each having a formation to engage the corresponding needle, thereby to move the same from a reverse plating position to a normal plating position, whereby auxiliary means is provided for insuring a change from reverse plating relation to normal plating relation of said threads.

In testimony whereof, we have signed our names to this specification.

JOHN LAWSON.
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