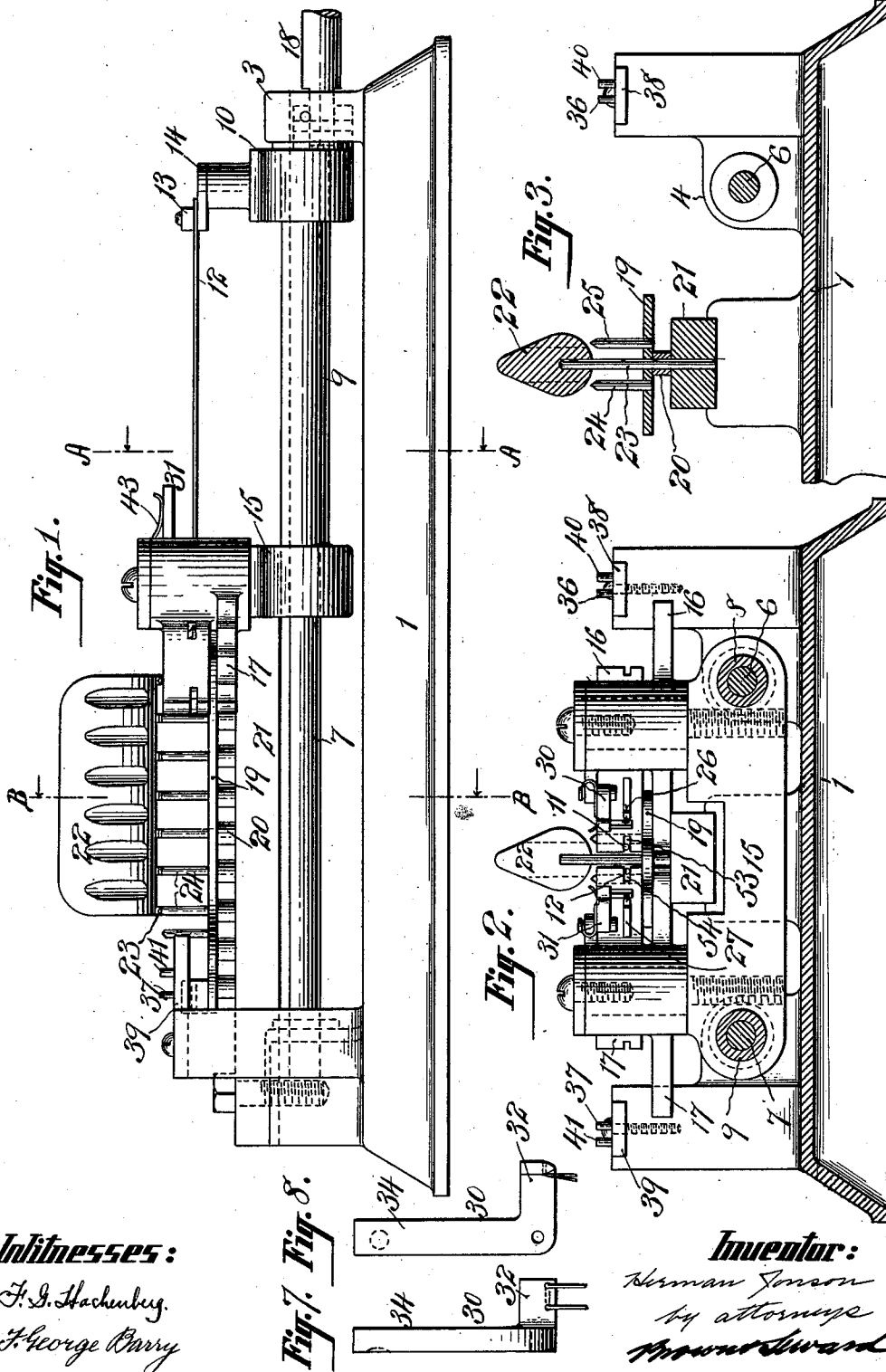


H. JONSON.
MACHINE FOR INSERTING PUCKER CORDS IN TUBULAR STRUCTURES.
APPLICATION FILED AUG. 7, 1906.

1,023,426.

Patented Apr. 16, 1912.

4 SHEETS-SHEET 1.



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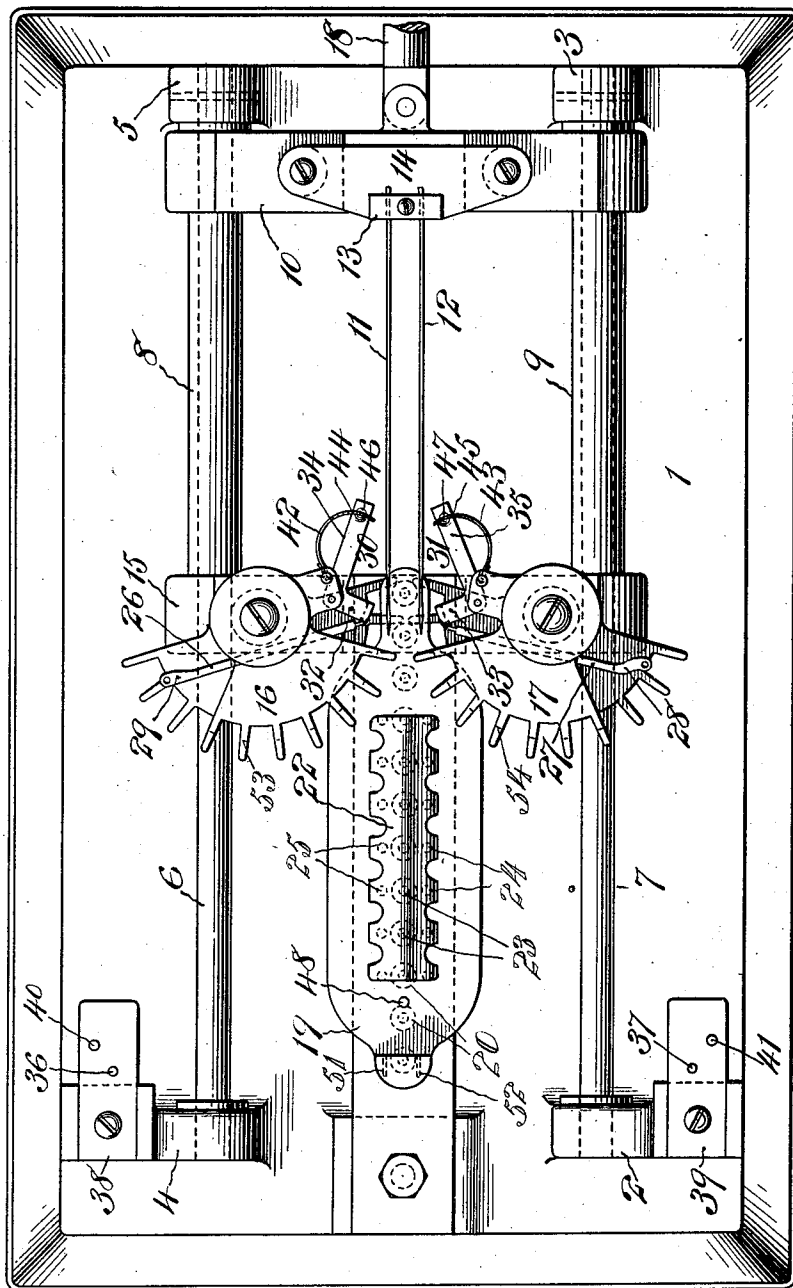
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4 SHEETS-SHEET 2.

Fig. 4.



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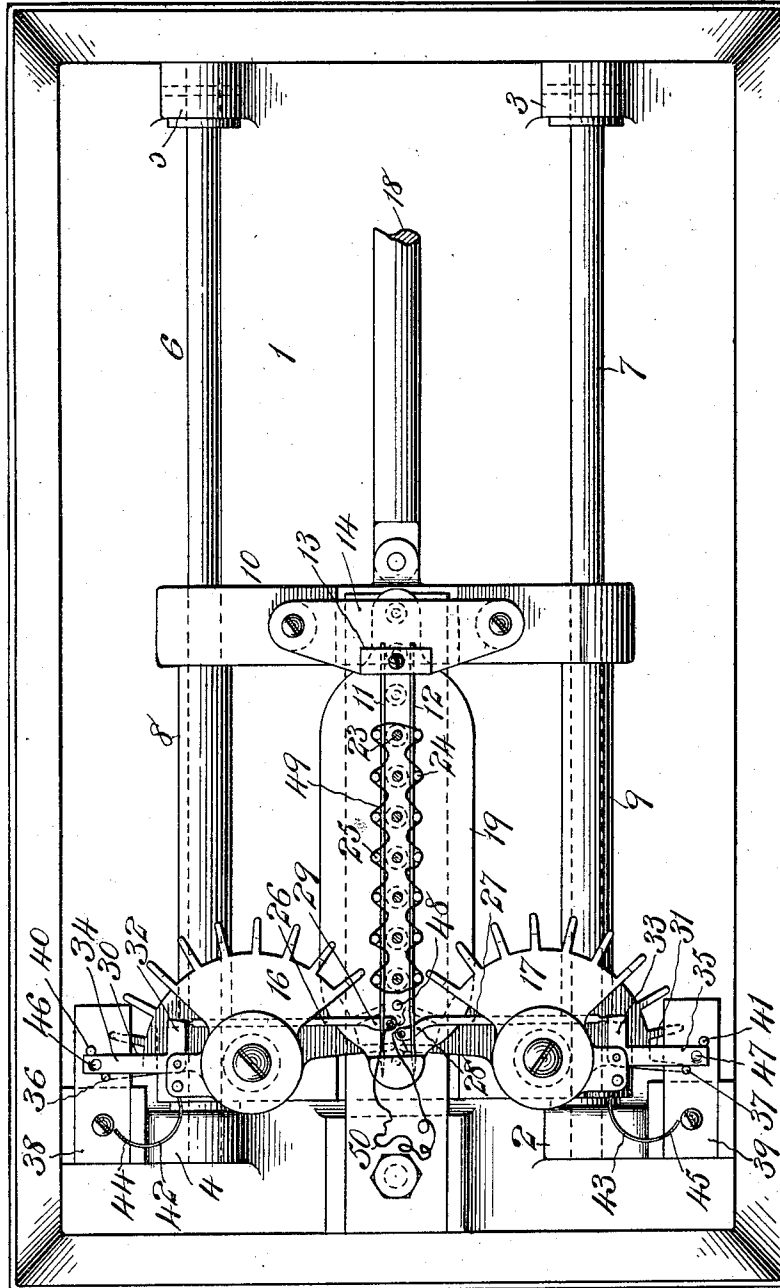
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4 SHEETS-SHEET 3.

Fig. 5.



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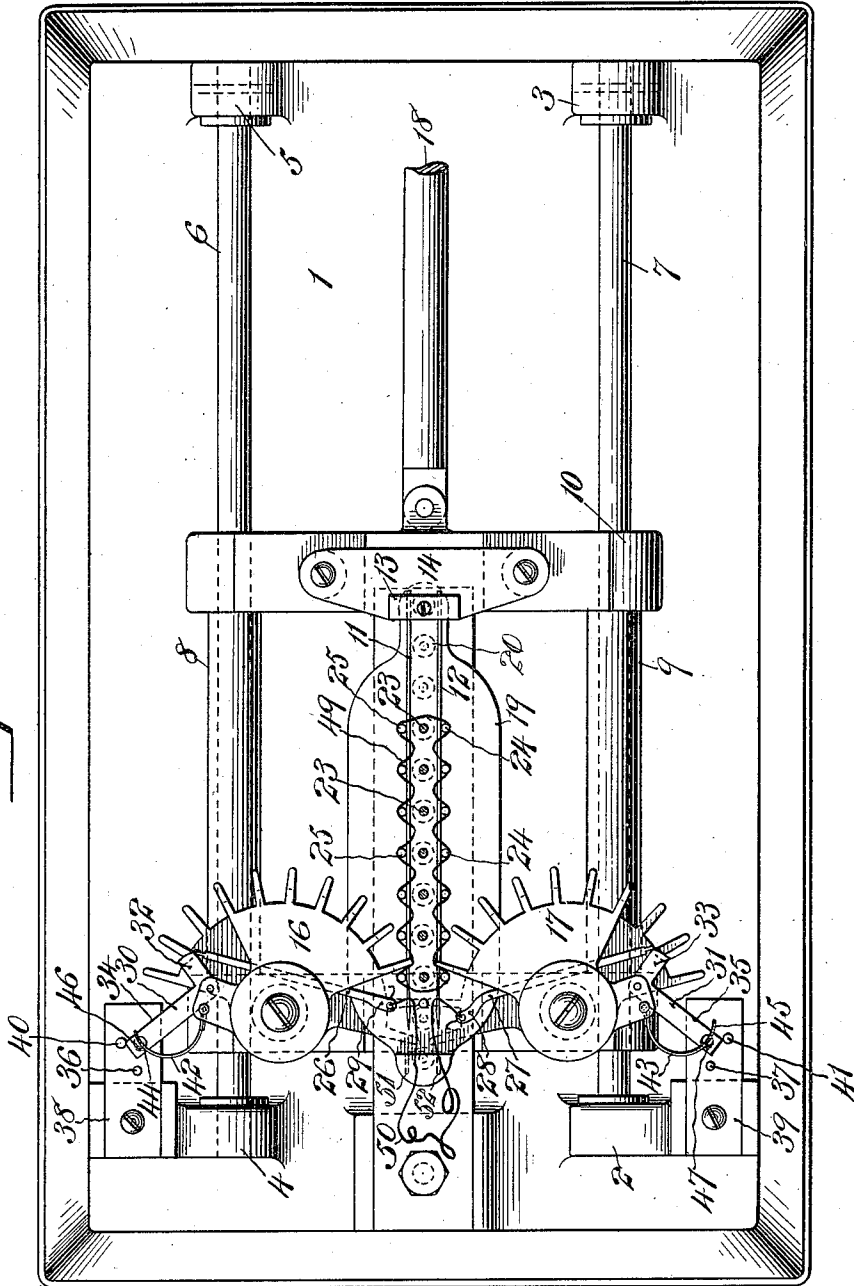
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4 SHEETS—SHEET 4.

1,023,426.

Fig. 6.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR INSERTING PUCKER-CORDS IN TUBULAR STRUCTURES.

1,023,426.

Specification of Letters Patent.

Patented Apr. 16, 1912.

Application filed August 7, 1906. Serial No. 329,554.

To all whom it may concern:

Be it known that I, HERMAN JONSON, a citizen of the United States, and resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Machines for Inserting Pucker-Cords in Tubular Structures, of which the following is a specification.

My invention relates to a machine for inserting a pucker cord in a tubular structure.

The object is to provide for consecutively forming the gathers in advance of the needles, relying upon the needles to hold the puckers in position and in connection therewith to provide convenient means for threading the needles after they have been advanced through the gathers or folds.

In the accompanying drawings, Figure 1 is a view of the machine in side elevation showing the needles withdrawn for the reception of the structure to be operated upon, Fig. 2 is a transverse section in the plane of the line A—A, Fig. 1, looking toward the left as the drawing is held, Fig. 3 is a transverse section in the plane of the line B—B, Fig. 1, Fig. 4 is a top plan view showing the parts in the position which they assume when the needles are withdrawn for the reception of the tubular structure to be operated upon, Fig. 5 is a similar view showing the position of the parts when the needles have been advanced through the folds of the structure with the threading devices in position to receive the thread, and with the guide block removed, Fig. 6 is a similar view showing the position of the parts after the needles have traveled a short distance on their return movement, and with the guide block removed, and Figs. 7 and 8 show the bell crank lever for operating the threading device in elevation and plan respectively.

The machine frame comprises a base 1 from which posts 2, 3 and 4, 5 uprise for the reception of a pair of ways in the present instance a pair of round bars 6 and 7. On these bars the operating mechanism is arranged to slide as follows. A pair of sleeves 8 and 9 are fitted to slide on the rods 6 and 7 respectively and these sleeves are connected at their outer ends by a yoke or cross-beam 10 to which the needles 11 and 12 are fixed by means of a clamp plate 13 made

fast to a supporting plate 14. At the opposite ends, the sleeves 8 and 9 are connected by a box yoke 15 in which are journaled a pair of toothed sectors or side members denoted respectively by 16 and 17. The sleeves 8 and 9 with their needle supporting and sector supporting yokes 10 and 15 constitute a sliding carriage which may be operated by means of a rod 18 connected with a suitable source of power, not shown, or it may be moved by hand.

Centrally between the ways 6 and 7 and in advance of the needles 11 and 12, there is mounted a plate or table 19 supported by a series of posts 20 on a beam or plate 21 fixed to and supported on the base 1. The series of posts 20 is located midway between the toothed sectors 16 and 17 and forms in effect a rack bar common to the two so that when the carriage is advanced, the engagement of the teeth on the sectors 16, 17, with the posts 20 will cause the two sectors to rotate on their axes, bringing their teeth consecutively between the posts 20. Above the posts 20, there is mounted a center member or guide block 22, preferably pear-shaped in cross section as shown and vertically corrugated and supported by a series of pins 23 forming extensions of the axes of the posts 20. On opposite sides of the central line of the table 19, there is located a series of pins, the series on one side being denoted by 24 and the series on the opposite side by 25. These pins are set fast in the table 19 and extend upwardly therefrom, stopping a short distance below the guide block 22. The needles 11, 12 are so spaced with respect to the series of pins 24, 25, that they will, when they advance, follow along in proximity to the inner faces of the series of pins 24, 25, as clearly shown in Figs. 5 and 6.

For the purpose of conveniently threading the needles after they have been passed through the folds in the structure to be operated upon, I provide each of the toothed sectors with a longitudinally sliding threading device consisting of a bar having its head toward the needles flattened sufficiently to pass through the eye of the needle and provided with a perforation extending vertically therethrough. These threading devices carried by the toothed sectors are denoted respectively by 26, 27. The head 28

of the threading device 27 is conveniently offset so that it may pass the head 29 on the said threading device 26 as they pass through the eyes of the needles into the position shown in Fig. 5. These longitudinally sliding threading devices are operated by means of bell crank levers 30, 31, pivotally secured to their respective sectors with their short arms 32, 33, connected with the sliding threading devices and their long arms 34, 35, in position to engage pins 36, 37, fixed on supports 38, 39, made fast to the base to tilt the lever, throwing the threading devices inwardly through the eyes of the needles as the needles approach the limit of their advance movement and during the early part of the return movement of the needles, these long arms will engage their pins 40, 41, to tilt them back into the position to withdraw the threading devices from the eyes of the needles. In this withdrawn position these bell crank levers will be frictionally held by means of friction springs 42, 43, made fast at one end to the supports for the sector wheels and their opposite ends provided with bent noses 44, 45, to engage depressions 46, 47, in the faces of the long arms of the bell crank levers.

The table 19 may be conveniently provided with a post 48 located in position to receive the bite of the thread as it is drawn by the needles through the several folds to prevent it from becoming displaced. In Figs. 5 and 6, the tubular structure to be operated upon is denoted by the line 49 and the pucker cord or thread is denoted by 50. The table 19 is further provided with two recesses 51, 52, arranged to receive the points of the needles 11, 12, as they near the limit of their forward movement so that the needles are centered and held against lateral movement while the threading device is operated. It will be understood that the needles 11, 12, pass through recesses 53, 54, in the faces of the teeth of the sectors 16, 17.

In operation, assuming the parts to be in the position shown in Fig. 4, the mouth of the tubular structure to be operated upon may be slid down over the guide block 22 and over the series of pins 24, 25, until it rests in engagement with the top of the table 19. The carriage carrying the needles and sector wheels is then advanced, the teeth on the sector wheels gathering the mouth of the tubular structure into folds indicated by the line 49, these folds being formed consecutively immediately in advance of the points of the needles and the needles themselves passing through the folds one after another as they are formed by the teeth. As the sector wheels reach the limit of their movement, the needles project beyond the tubular structure and at this moment the angle levers are locked and the threading devices are passed through the

eyes of the needles into the position shown in Fig. 5. The operator now passes the ends of the thread 50 through the eyes in the threading devices and the carriage is given the reverse or return movement. The early part of this movement rocks the angle levers, withdrawing the threading devices from the needles and by so doing, drawing the ends of the thread through the eyes of the needles. The further return movement of the carriage will draw the thread successively through the several folds or gathers and finally the free ends of the threads will be withdrawn from the eyes of the needles and the tubular device with its pucker cord in place may be removed from the guide block, its gathers passing up over the series of pins 24, 25, between the guide block and the tops of the pins.

It is obvious that changes might be resorted to in the form and arrangement of the several parts without departing from the spirit of my invention; hence I do not wish to limit myself strictly to the structure herein described, but

What I claim is:

1. In a machine for inserting a pucker cord in a tubular structure, a guide for supporting the structure, toothed sectors arranged to travel along on opposite sides of the guide with their teeth consecutively impinging the structure, and needles arranged to consecutively pierce the folds or gathers formed by the teeth.
2. In a machine for inserting a pucker cord in a tubular structure, series of pins spaced apart and arranged to receive around their exterior faces the structure to be operated upon, needles arranged to pass between the series of pins, and toothed sectors arranged to consecutively force the structure to be operated upon in the form of a fold or gather between the successive pins into position to be pierced by the needles.
3. In a sewing machine of the class described, the combination of a toothed center member, toothed members acting on either side of the said center member, means for moving said side members in a direction longitudinally of the center member so that the teeth of each side member may coact with the teeth on the adjacent side of the center member, and needle mechanism co-operating therewith.
4. The combination with a mandrel, of a rotary plait-forming device having a traveling axis of movement and a plurality of teeth that successively act upon the fabric to form plaits therein during such travel, means for effecting its rotation during the travel of its said axis, and means for passing a thread through the plaits formed thereby, said last mentioned means and mandrel being relatively movable.
5. The combination with a mandrel, of a

rotary plait-forming device having a traveling axis of movement, and a needle that moves in substantially the same direction and simultaneously with the said axis.

5 6. The combination with a mandrel, of rotary plait-forming devices having traveling axes of rotation and effecting their shirring actions during the travel of their said axes, and a relatively movable needle co-
10 operating therewith.

7. The combination with a mandrel, of rotary means that also travel bodily, and during such bodily movement forms plaits in coöperation with said mandrel, and a
15 needle for penetrating the plaits.

8. The combination with a mandrel, of relatively reciprocable and rotary plait-forming devices, a needle reciprocating therewith to penetrate the plaits, and means
20 operable at one end of the travel for pulling a thread through the eye of the needle, substantially as described.

9. The combination with a mandrel, of relatively reciprocable and rotary plait-forming devices, a needle reciprocating therewith to penetrate the plaits, and trans-
25 versely movable means operable at one end of the travel for pulling a thread through the eye of the needle, substantially as described.
30

10. In a sewing machine of the class described, the combination of a toothed center member, toothed and slotted side members capable of a movement of rotation and
35 adapted to receive a needle, means for causing the said rotary side members to travel over opposite sides of the center member longitudinally thereof, and needle mechanism with means for operating the said
40 needle mechanism to take up a running stitch step by step during the operation of the center and side members.

11. In a sewing machine of the class described, the combination of a toothed center member for corrugating fabric, rotary
45 toothed side members acting on either side of the center member, means for producing a relative movement longitudinally of the center member, between the said center
50 and side members, such as to engage the teeth of said rotary members successively with the teeth of the center member, needles, and means for moving said needles to make the stitch as the corrugations are formed.

12. In a sewing machine of the class described, the combination of a toothed center member, circular toothed side members acting on either side of the center member,
60 means for moving the said side members in a direction longitudinally of the center member, so that the teeth of the side members may coact with the teeth on opposite sides of the center member, and needle mechanism coöperating therewith.

13. In a sewing machine, the combination

of a corrugating device comprising a member, a toothed wheel device having an opening running circumferentially of the same and adapted to receive a needle, means for
70 causing the said toothed wheel device to travel over one side of the member, and during such travel to corrugate the material interposed between the two, and a needle that operates in the circumferential opening of the toothed wheel device, said member
75 and needle being relatively movable.

14. The combination with a mandrel, of rotary toothed wheels disposed to pass longitudinally on either side thereof, and a
80 needle passing through the mandrel, substantially as described.

15. The combination with a carrier having a plurality of needles, of a guide between the needles for maintaining the separation thereof, and rotary gathering devices
85 that travel in the direction of the needles during their rotation, substantially as described.

16. The combination with a carrier having a plurality of needles, of a guide between the needles for maintaining the separation thereof, and rotatable needle guide
90 means moving with the needles, substantially as described.

17. The combination with a carrier having a plurality of needles, of a guide between the needles for maintaining the separation thereof, and rotatable needle guiding
95 and plaiting devices moving with the needles, substantially as described. 100

18. In a sewing machine, the combination with a fabric supporting member and needle mechanism coöperating therewith, said member and mechanism being relatively movable back and forth, of shirring mechanism
105 coöperating with the fabric supporting member and including fabric-engaging means capable of said relative back and forth movement with the needle mechanism and with respect to said member. 110

19. In a sewing machine of the character set forth, the combination with a fabric supporting member and needle mechanism capable of back and forth movement with respect thereto, of shirring mechanism
115 including fabric-engaging means movable with the needle mechanism in the same directions coöperating with the supporting member.

20. In a sewing machine of the character set forth, the combination with a fabric supporting member and needle mechanism capable of back and forth movement with respect thereto, of shirring mechanism
120 including fabric-engaging means that is movable with the needle mechanism in the same directions and coöperating with the supporting member, said shirring mechanism also turning on an axis during such move-
125 ment. 130

21. In a sewing machine of the character set forth, the combination with a central fabric supporting member, of spaced needles, said member and needles being relatively
5 movable back and forth, and fabric-engaging shirring devices coöperating respectively with the opposite portions of the support and having the same relative movement with the needles and with respect to the sup-
10 port.

22. In a sewing machine of the character set forth, the combination with a fabric supporting member, of a carriage movable back and forth with relation thereto, a needle,
15 and fabric-engaging shirring means both mounted on the carriage and movable therewith.

23. In a sewing machine of the character set forth, the combination with a fabric supporting mandrel, of a reciprocatory carriage, needles mounted on the carriage and co-
20 operating with the mandrel, and rotary shirring wheels journaled on the carriage and coöperating with the mandrel during the reciprocation of said carriage.

24. In a sewing machine of the character set forth, the combination with a fabric supporting mandrel, of a needle coöperating therewith, and a shirring device that travels
30 from one end of the mandrel toward the other end, said shirring device having relatively fixed teeth that successively produce shirrs in the fabric placed on the mandrel.

25. In a sewing machine of the character set forth, the combination with a fabric support, of needle mechanism, shirring means coöperating therewith, operating mechanism
35 for the shirring mechanism, and means for placing a cord in the needle mechanism, said means being actuated by the shirring means.

26. In a sewing machine of the character set forth, the combination with a fabric support, of needle mechanism, shirring means coöperating therewith, operating mechanism
45 for the shirring means, and means for introducing a cord in the needle mechanism, said means being carried by the shirring means.

27. In a sewing machine of the character set forth, the combination with a fabric support, of needle mechanism, and rotatable shirring means coöperating with the fabric
50 support, operating mechanism for the shirring means, and means rotatable in the shirring means for introducing a cord into the needle mechanism.

28. In a sewing machine of the character set forth, the combination with a fabric support, of shirring means, a needle that passes through the shirrs formed by said means, a
60 threading device operated by the shirring means to present said device to the eye of the needle after the latter has passed through the shirrs, and means for actuating the threading device to pass the same

through the eye of the needle to which it is
65 presented.

29. In a sewing machine of the character set forth, the combination with a fabric support, of shirring means coöperating therewith, a needle that passes through the shirrs
70 formed by said means, and a threading device coöperating with the needle and having a rotary movement and a reciprocatory movement.

30. In a sewing machine of the character set forth, the combination with a fabric supporting mandrel, of rotary shirring means that travels along the same, a needle that
75 passes through the shirrs formed by the shirring means, a threading device rotatable with the shirring means and capable of back and forth movement thereon, and means for reciprocating the threading device to cause it to pass through the eye of the needle after
80 said eye has passed through the shirrs.

31. In a sewing machine of the character set forth, the combination with a fabric support, of a shirring device coöperating with the support and movable back and forth
85 along the same, means for causing the shirring device to rotate during its travel, and needle mechanism that passes through the shirrs formed by said shirring means.

32. In a sewing machine of the character set forth, the combination with a fabric support, of a fabric-engaging shirring device coöperating with the said support and movable
90 back and forth along the same, gearing connected to the shirring device for effecting its rotation during its travel, and needle mechanism that passes through the shirrs formed by said shirring means.

33. In a sewing machine of the character set forth, the combination with a fabric support and a rack associated therewith, of
105 shirring means that travels back and forth along the support and during such travel forms shirrs in the material, gear mechanism carried by the means and engaging the rack to effect the rotation of the shirring means
110 during its travel, and means for passing a thread through the shirrs thus formed.

34. In a sewing machine of the character set forth, combination with a fabric supporting mandrel having spaced shirr-receiv-
115 ing sockets, of a reciprocatory carriage, needles mounted on the carriage and traversing the mandrel, rotatable shirring wheels carried by the carriage and moving along the mandrel in advance of the needles,
120 a rack located below the mandrel, gears carried by the shirring wheels and engaging the rack, and needle threading means mounted on the shirring wheels and rotatable therewith.

35. The combination with shirring means and a reciprocatory needle having an eye, of a thread-carrying device mounted to

move bodily with the needle, and means for limiting the movement of the needle and reciprocating the thread-carrying device transversely through the eye of the needle
5 at each reciprocation.

36. The combination with shirring means and a reciprocatory needle, of a thread-carrying device mounted to move bodily with the needle, and means for automati-
10 cally reciprocating the thread-carrying device through the eye of the needle when the needle stops at one extreme.

37. The combination with shirring means and a movable needle, of a threading device

bodily movable with the needle, and actu- 15
ating means effective at a certain position of the needle for operating the threading device to cause it to pass through the eye of the needle at each reciprocation.

In testimony, that I claim the foregoing 20
as my invention, I have signed my name in presence of two witnesses, this 31st day of July 1906.

HERMAN JONSON.

Witnesses:

FREDK. HAYNES,
HENRY THIEME.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."