

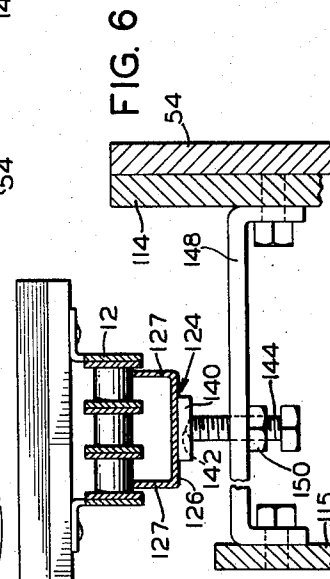
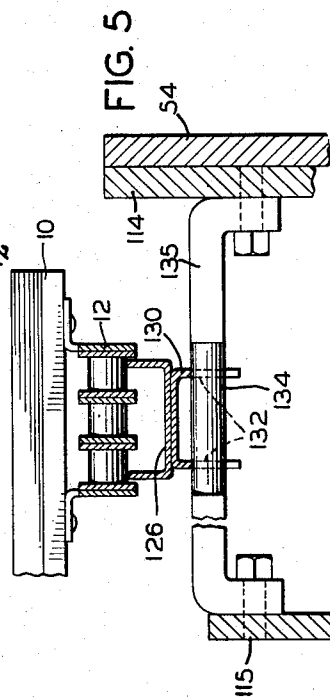
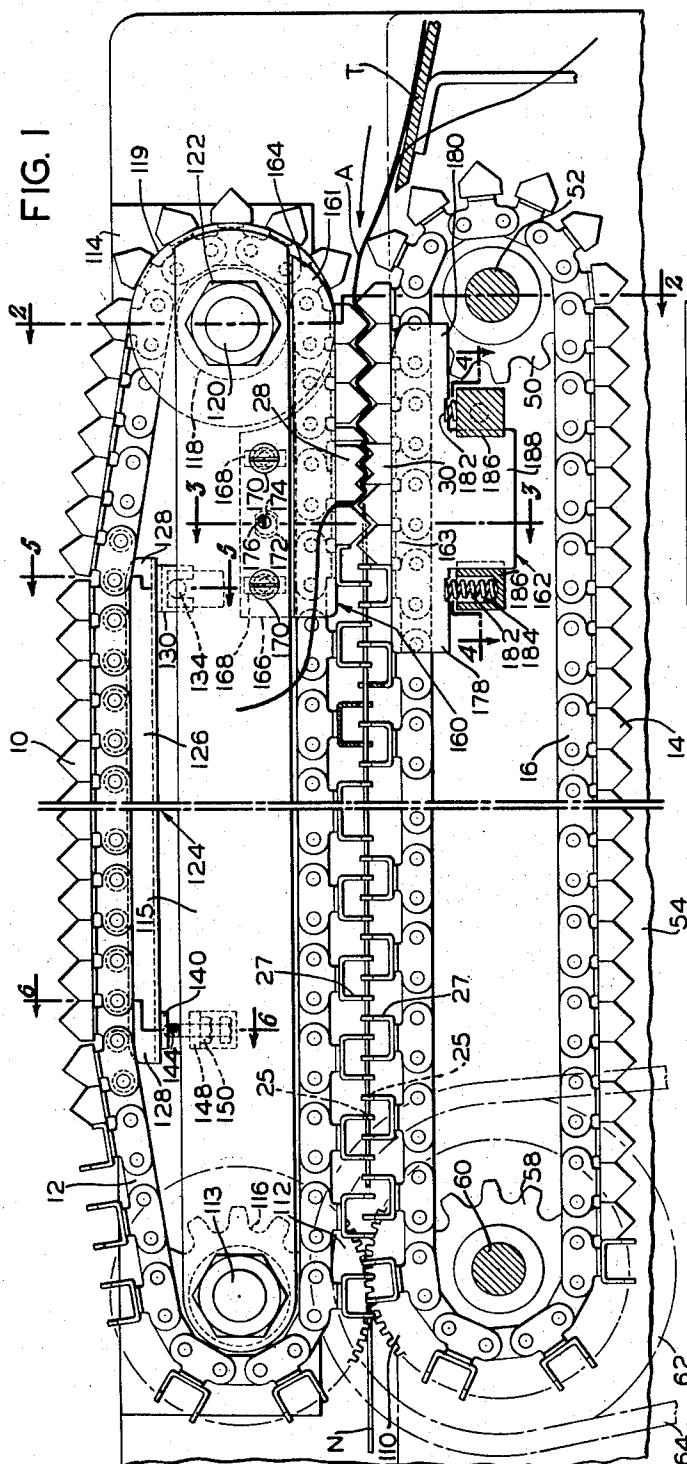
Feb. 3, 1959

G. F. McEWEN ET AL  
SLIP STITCHING MACHINE

2,871,807

Filed May 15, 1956

2 Sheets-Sheet 1



INVENTOR  
JAMES J. McGINLEY  
GERALD F. McEWEN  
BY  
*Ventworth & Clapham*  
ATTORNEY



1

2,871,807

## SLIP STITCHING MACHINE

Gerald F. McEwen, Mountain Lakes, N. J., and James J. McGinley, Williston Park, N. Y., assignors to American Machine & Foundry Company, a corporation of New Jersey

Application May 15, 1956, Serial No. 585,068

10 Claims. (Cl. 112—174)

This invention relates to slip stitching machines, and more particularly to necktie slip stitching machines of the type provided with an elongated threaded needle and opposed traveling crimping or pleating members for progressively pleating an assembled superposed necktie fabric and lining or linings, or necktie assembly and moving the pleated assembly onto the needle.

In necktie slip stitching machines of this type heretofore used in the art, it has been found that there is a tendency to disturb the proper seating relationship between the upper and lower complementary crimpers or pleating members when a necktie assembly is fed therebetween. Due to this condition, the pleating members or crimpers are not able to exert their full pleating influence upon a necktie assembly being pleated, and being advanced thereby onto the stationary needle.

In accordance with the invention, there are provided means in the form of a pressure member which is located adjacent the infeed work station and so positioned relative to the upper pleating members or crimpers that there is substantially no upward movement of the lower run of the upper traveling work pleating or crimping member regardless of the bulk of a necktie assembly to be stitched. Therefore, the crimping members on the upper traveling member are maintained in substantially full crimping or pleating engagement with the complementary crimping or pleating members on the lower opposed traveling member. A lower pressure member coacts with the upper pressure member. This pressure member is so positioned for coaction with the upper pressure member that the limits of separation or movement apart of the operative runs of the traveling work pleating members can be controlled as desired, in accordance with the thickness of a selected type of necktie assembly assembled at the work infeed station and then fed between the complementary traveling work crimping members onto the needle.

In order to make desired adjustments in accordance with the thickness of a necktie assembly, at least one of the pressure members is adjustably mounted for movement relative to the other pressure member into a desired operative position, after which it is secured by locking means in such adjusted position.

Trends in necktie design have resulted in it being necessary to increase the amount of slip stitching required to properly secure a necktie assembly. In order to make this possible in a machine of the type described hereinabove, the length of the opposed traveling crimping or pleating systems has been increased, which has resulted in an increase in weight because of the increase in the number of pleating members or crimpers required to effect the desired result. In order to insure that the pleating members or crimpers will function to their fullest extent and advance the progressively pleated sections of the necktie assembly on the elongated needle, there is provided an elongated support member on which the upper run of the upper traveling pleating member or crimping member travels and is supported against sagging. This arrangement insures against an improper disposition of

2

the operative crimpers of the upper crimping pleating system relative to the complementary pleating members on the lower traveling pleating system. The operative position of the elongated support may be adjusted in order to secure it in the most satisfactory operative position.

It is an object of the invention to provide an improved necktie slip stitching machine wherein means are provided for holding in engagement adjacent the front end of the machine the pleating members of two opposed endless systems so as to insure substantially full intermeshing of the pleating members or crimpers and thereby effect the formation of satisfactory pleats in a necktie assembly as it is progressively pleated and moved onto an elongated needle.

It is a further object of the invention to provide opposed relatively movable pressure members coacting with the opposed endless crimping or pleating systems of a necktie slip stitching machine having opposed endless crimping units, and means for adjusting the positions of the pressure members so as to readily adapt the machine for satisfactory stitching together of many types of necktie assemblies.

It is a further object of the invention to provide a slip stitching machine of the type having an elongated threaded needle and opposed traveling crimping or pleating members which progressively pleat a necktie assembly and wherein the traveling crimping or pleating members extend along a part only of the length of the endless supports forming a part of the traveling members, the remainder of the length of the traveling members being provided with complementary intermeshing channel members which are lighter in weight than the pleating members so that the weight of the traveling members is greatly reduced, thereby lessening wear and tear on the machine and making it possible to operate the machine with less power, and with greater rapidity, especially in the reversing of the endless members in removing a stitched necktie assembly therefrom.

The invention is further characterized by the provision of an elongated support operative to prevent the upper free run of the upper traveling crimping or pleating member from sagging, and thereby insure that at all times during the operation of the machine the crimpers or pleating members on one traveling member will be properly centered for accurate meshing with those on the opposed traveling member.

With these and other objects not specifically mentioned in view, the invention consists in certain combinations and constructions which will be hereinafter fully described, and then set forth in the claims hereunto appended.

In the accompanying drawings which form a part of this specification, and in which like characters of reference indicate the same or like parts:

Fig. 1 is a partial side elevation partly in section of a necktie slip stitching machine embodying our invention.

Fig. 2 is a vertical sectional view taken on line 2—2 in Fig. 1.

Fig. 3 is an enlarged vertical sectional view taken on line 3—3 in Fig. 1.

Fig. 4 is a view taken on line 4—4 in Fig. 1.

Fig. 5 is a vertical sectional view taken on line 5—5 in Fig. 1.

Fig. 6 is a vertical sectional view taken on line 6—6 in Fig. 1.

The slip stitching machine embodying the present invention may be of the type disclosed in Neumair Patent 2,372,224 and Neumair et al. Patent 2,387,282.

Referring to Figure 1, pleating members or crimping bars 10 on upper sprocket chain 12 and pleating members or crimping bars 14 on the lower sprocket chain 16 have

suitably bevelled faces to provide triangular teeth which inter-engage with each other as shown, to form pleats in a necktie assembly A, and advance the same over an elongated needle N. As used herein, a necktie assembly means a superposed necktie and lining or linings, or a necktie fabric, lining and/or linings, and a tape or other type of lining or lining combination which may be used in the formation of four-in-hand neckties.

Needle N is slidably mounted in a needle holder (not shown) arranged at the rear of the machine and supported in a holder (not shown) similar in construction and operation to that disclosed in Neumair et al. Patent 2,387,282. Since the means for supporting the needle form no specific part of the present invention, further description and illustration thereof are considered to be unnecessary to an understanding of the invention.

The shank of needle N extends forwardly through transverse slots or recesses 24 and 26 in crimper bars 10 and 14, and through slots or recesses 25 in intermeshing guiding and supporting channel elements 27. The slots or recesses in opposed crimper bars or pleating members 10 and 14, and in channel elements 27 are aligned with each other and coact to grip the needle and support it while a necktie assembly is being advanced upon the shank of the needle when sprocket chains 12 and 16 are driven in a direction to cause pleating members 10 and 14 to pleat and advance a necktie assembly onto needle N.

It is desirable to form relative short stitches in the leading end of the lining portion ahead of the longer stitches which hold the parts of a necktie assembly together. For this purpose, there are also mounted on the respective sprocket chains 12 and 16 opposed crimper bars or pleating members 28 and 30, whose opposed faces have inter-engaging teeth which form a series of relatively narrow pleats in the leading end of the lining portion, so that upon penetration of the same by needle N, there will be formed a series of short stitches ahead of the stitches formed when the pleats resulting from the inter-engagement of crimper bars or pleating members 10 and 14 are penetrated by needle N. For a further disclosure of the structure of crimper bars 28 and 30, reference is made to Neumair et al. Patent 2,387,282 inasmuch as this crimper bar structure forms no specific part of the invention.

Lower sprocket chain 16 is formed as a triple width chain running over a triple sprocket 50 located at the front of the machine adjacent work infeed table T. Sprocket 50 is fastened on shaft 52 supported in front frame 54 and a rear frame 56, these frames being supported on the bed (not shown) of the machine. Chain 16 also runs over a triple sprocket 58 mounted at the back of the machine on shaft 60 which is supported in front and rear frames 54 and 56. Shaft 60 carries a sprocket 62 driven by a sprocket chain 64 running on a sprocket (not shown) mounted on a shaft (not shown) driven from a suitable source of power. It will be understood in a machine of this type that the chains are driven in one direction or to the back of the machine during the stitching of each necktie assembly, and that as soon as the stitching operation is completed, the direction of movement of the chains is reversed in order to eject the stitched necktie assembly from the machine. The needle, which has an eye adjacent its point, is threaded with an endless thread from a suitable source of supply and as the necktie assembly is removed from the machine, the thread is naturally disposed throughout the entire stitched length of the necktie assembly. The mechanism for driving and reversing the direction of movement of chains 12 and 16 does not form a specific part of the invention and accordingly further disclosure and description thereof is omitted. Reference is made to Neumair et al. Patent 2,387,282 which discloses this mechanism.

A gear 110 mounted on shaft 60 meshes with and drives a gear 112 attached to triple sprocket 116 supported by a bolt 113 passing through front frame 54 and supporting the rear ends of plates 114 and 115. Sprocket 116, which

is loosely mounted on the portion of bolt 113 between plates 114 and 115, drives triple sprocket chain 12, the latter running over an idler roller 118 loosely mounted on stud 120. This stud passes through the front end of plate 115, roller 118 and is threadably secured in plate 114. Roller 118 is provided with spaced flanges 119 and 121 which support the ends of crimper bars or pleating members 10 as they pass around roller 118. A nut 122 threaded on the outer end of stud 120, retains roller 118 in proper operative relationship.

As mentioned hereinabove, the requirements of present trends in necktie design and construction have made it necessary to increase the length of slip stitching in attaching the necktie fabric and lining portions together when making up a necktie assembly. In slip stitching machines embodying the invention, it was found that with increased length of sprocket chains, and additional crimper bars or pleating members, which necessarily increased the weight thereof, considerable sagging occurred in the upper run of upper endless chain 12. This sagging resulted in an improper alignment or centered relationship between opposed crimper bars or pleating members 10 and 14. In order to insure against sagging of chain 12, there has been provided a support mechanism designated generally 124 which not only supports the upper run of endless chain 12, but also guides it as it travels from rear to front, or front to rear, depending upon whether a necktie assembly is being slip stitched or ejected from the machine.

In the form illustrated, support mechanism 124 comprises an elongated channel support 126, the legs 127 of which project upwardly and are spaced apart a distance such that the rollers of the outer runs of endless chain 12 engage and roll therealong. The ends of legs 127 are rounded at front and back of the machine, as at 128, to act as guides for the rollers of chain 12 running on and off the legs 127. As shown in Figure 1, channel support 126 is pivotally mounted at one end so that it can be adjusted vertically to control the amount of sag as required. Referring to Figure 1, the underside of channel 126 is provided near one end with a generally U-shaped member 130 having cut-out portions 132 formed in the spaced downwardly depending legs thereof. These portions engage a transverse round portion 134 formed in a bracket 135 having its ends secured in any suitable manner to plates 114 and 115.

Adjacent the other end of channel support 126 and secured to the underside thereof is a block 140 provided with an opening 142 formed therein adapted to receive the pointed end of an adjusting screw 144 threadably mounted in bracket 148, the ends of which are attached to plates 114 and 115, respectively. A lock nut 150 secures set screw 144 in its adjusted position.

It is highly desirable that at all times in the progressive pleating and forwarding of the pleated portions of a necktie assembly upon needle N, the pleating members or gripper bars 10 and 14 be maintained in substantially full crimping or pleating engagement regardless of variations in the thickness of different types of fabrics and lining or linings being stitched together. In order to maintain gripping members 10 and 14 in substantially full crimping or pleating engagement, the invention includes the provision of opposed pressure members which engage pleating members or crimper bars 10, 14 and maintain them in proper operative relationship during the stitching operations incident to slip stitching together the parts of a necktie assembly.

Referring to Figures 1 and 3, it will be seen that an upper pressure member designated generally 160, and a lower pressure member designated generally 162, preferably spaced laterally therefrom, are provided. Upper pressure member 160 comprises an elongated bar or shoe 161, the lower face of which bears against or presses upon the backs of crimper bars or pleating members 10. Lower pressure member 162 comprises an elongated bar

5

or shoe 163 which bears against or presses upon the backs of lower crimper bars or pleating members 14. Upper pressure member 160 is formed with a curved infeed portion 164 which conforms with the arc of flange 119 of pulley 118, and is so positioned with respect to work infeed table T that it assists in guiding necktie assemblies properly into pleating engagement with crimper bars or pleating elements 10 and 14, as each necktie assembly is fed over infeed table T.

Pressure member 160 is formed with an upstanding flange 166 having spaced vertical slots 168 through which extend screws 170 by means of which upper pressure member 160 is maintained in proper operative relationship with respect to crimper bars or pleating members 10. Flange 166 is also provided with an elongated opening 172 which is engaged by an eccentric 174 formed integrally with a screw 176. By means of the structure described when screws 170 are loosened and screw 176 is turned, the coaction between slot 172 and eccentric 174 either raises or lowers upper pressure member relative to crimper bars 10 so that the proper adjustment of upper pressure member 160 can be obtained in accordance with the thickness of each type of necktie assembly to be stitched. Screws 170 are then turned home to secure the adjustment.

Since considerable pressure is exerted by crimper bars 10 against the elongated face of upper pressure member 160, it is preferred that upper pressure member 160 be formed of a material which is self-lubricating thereby minimizing friction and wear and tear on the parts. It has been found that if upper pressure member 160 is made of close grained cast iron boiled in oil, the pores of the iron become filled with oil and thus there is a satisfactory self-lubricating engagement between the face of upper pressure member and the backs of crimper bars 10.

Lower pressure member 162 in the form illustrated, is provided with two end wings 178 and 180, the under surfaces of which are engaged by the free ends of springs 182 seated in bores 184 formed in transverse bars 186, the ends of which are suitably attached to frames 54 and 56. In order to prevent lateral movement of lower pressure member 162 relative to chain 16, it is provided with a depending portion 188 which is slidably mounted in slots 190 formed in bars 186. As in the case of upper pressure member 160, lower pressure member 162 also is formed of the same close grained oil treated cast iron.

In order to further lessen the over-all weight of chains 12 and 16 and the crimping bars or pleating members 10 and 14, some of the crimper bars 10 and 14 may be replaced by channel members 27 which as shown in Figure 1, are mounted on chains 12 and 16 in a manner similar to the mounting of crimper bars 10 and 14. The number of channel members 27 which extend along the lengths of chains 12 and 16 is dependent upon the length of slip stitching required to properly slip stitch together the parts of the necktie assembly. Therefore the number of crimper bars or pleating members 10 and 14 is such that the required number of pleats will be formed in the longest length of necktie assembly to be pleated and slip stitched. It is readily apparent that as soon as the longest length of necktie assembly has been pleated and the parts thereof slip stitched together, the machine is reversed to remove the slip stitched necktie from the machine so that when channel members 27 are provided, the latter, which are provided with recesses 25 to accommodate the needle, will serve to properly guide the needle and prevent it from buckling as each slip stitched necktie assembly is fed back to the operator and out of the machine.

As mentioned hereinabove, recesses 25 in channel members 27 are aligned with recesses 24 and 26 in crimper bars 10 and 14 for proper operation of the machine.

What we claim is:

1. In a necktie slip stitching machine having an elongated needle, the combination with a pair of endless sprocket chains having opposed runs, one of said chains overlying the other chain, rotatable driving and driven

6

means over which said chains run, a series of crimpers and a series of channel elements supported on each of said sprocket chains, said crimpers and said channel elements being provided with recesses formed thereon aligned with each other in adjacent runs, the crimpers and the channel elements on each of said opposed runs of said chains being adapted to inter-engage with the crimpers and the channel elements on the other of the opposed runs for pleating a necktie assembly between said inter-engaging crimpers, and said inter-engaging channel elements being operative to guide and constrain said needle against buckling, an infeed station, and means engaging the crimpers on said opposed runs of said chains adjacent said infeed station for maintaining the crimpers of said opposed runs against substantial vertical displacement whereby to insure uniform pleating of said necktie assembly fed between said crimpers.

2. The necktie slip stitching machine defined in claim 1, wherein said last named means comprises an elongated upper pressure member located adjacent and above said infeed station, said pressure member having a portion extending rearwardly from said infeed station in engagement with a plurality of crimpers on the lower run of said upper endless sprocket chain, a complementary pressure member coacting with said first-named pressure member and engaging a plurality of crimpers on the upper run of said lower endless sprocket chain, means mounting said upper pressure member for vertical adjustment to and from said lower pressure member to vary the limits of vertical separating movement of said crimpers in response to the movement of said endless chains and the pleating of a necktie assembly by said crimpers.

3. The invention defined in claim 2, including resilient means mounting said complementary pressure member, an elongated support extending beneath and supporting the spaced run of said upper sprocket chain, and means for adjusting the operative position of said support relative to said spaced run traveling therealong.

4. The invention defined in claim 2, including means for mounting said complementary pressure member, and wherein said complementary pressure member is supported on said mounting means for engagement with said crimpers on the upper run of said lower endless chain in a plane parallel to and laterally spaced from said upper pressure member.

5. In a sewing machine, a pair of endless sprocket chains having spaced runs and adjacent runs, an elongated series of crimpers and a contiguous elongated series of generally U-shaped elongated channel elements mounted on said runs of said sprocket chain, said crimpers and channel elements having portions extending laterally outwardly therefrom and moving in unison with said runs of said endless sprocket chains, said crimpers and channel elements being so mounted on said chains as to intermesh in the adjacent runs of said endless sprocket chains, said crimpers and channel elements having needle guiding and supporting recesses formed therein and aligned with each other in said adjacent runs, means mounting an elongated needle to extend through said recesses, whereby said needle is properly guided and supported against buckling during the operation of said machine.

6. In a necktie slip stitching machine, a pair of endless sprocket chains having spaced runs and adjacent runs, an elongated series of crimpers and a contiguous elongated series of generally U-shaped elongated channel elements mounted on said runs of said sprocket chains, and moving in unison with said runs of said endless sprocket chains, said crimpers and channel elements being so mounted on said chains as to intermesh in the adjacent runs of said endless sprocket chains, said crimpers and channel elements having needle guiding and supporting recesses formed therein and aligned with each other in said adjacent runs, means mounting an elongated needle to extend through said recesses, whereby said needle is properly guided and supported against buckling during

7

the operation of said machine, and an elongated support member extending beneath one of said spaced runs of said endless chain for supporting said run against downward deflection, whereby the intermeshing alignment of said crimpers is maintained substantially constant throughout the length of the adjacent runs of said endless chains. 5

7. The invention defined in claim 5 including a work infeed table located adjacent the point of said needle and wherein a portion of each of said crimpers and said channel elements extends freely outwardly beyond said chains, and means engaging said outwardly extending portions of a plurality of said crimpers on each of said adjacent runs proximate said infeed station to maintain said plurality of crimpers in substantially complete meshing engagement. 10

8. In a necktie slip stitching machine having an elongated needle, the combination with an upper endless sprocket chain and a lower endless sprocket chain having spaced runs, and adjacent opposed upper and lower opposed elongated runs, a work support table having a work infeed station, an upper roller and lower sprocket over which said respective chains run adjacent said infeed station, a pair of sprockets over which said chains run remote from said infeed station, an elongated series of crimper bars and a contiguous elongated series of channel elements mounted on each of said sprocket chains, the crimper bars and channel elements on each of the opposed runs of said chains being adapted to inter-engage with the crimper bars and channel elements on the other of the opposed runs and pleat a superposed necktie fabric and lining assembly introduced therebetween at said station and advance the same upon said needle to stitch said necktie fabric and lining together, pressure members, said pressure members having curved infeed surfaces located adjacent said work infeed station, means adjustably 15 20 25 30

8

mounting one of said pressure members for engagement with a plurality of crimpers on the lower run of said upper endless sprocket chain, means mounting the other of said members for engagement with a plurality of crimpers on the upper run of said lower sprocket chain, said pressure members being operative to prevent substantial vertical separating movement of said crimper bars and channel elements in response to the movement of said endless chains and the pleating of a necktie fabric and lining assembly by said crimper bars.

9. The invention defined in claim 8 including an elongated support extending beneath and supporting the spaced run of said upper sprocket chain, and means for adjusting the operating position of said elongated support relative to said spaced run traveling therealong.

10. The invention defined in claim 8, wherein said pressure members are of oil-impregnated cast metal and means mounting the first-named pressure member for vertical adjustment to vary the limits of upward movement of said lower opposed run of said upper sprocket chain relative to the upper opposed run of said lower sprocket chain in accordance with the thickness of a selected necktie fabric and lining assembly to be stitched.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |                     |               |
|-----------|---------------------|---------------|
| 1,224,993 | Anderson .....      | May 8, 1917   |
| 1,659,733 | Harbeck .....       | Feb. 21, 1928 |
| 1,699,764 | Solem .....         | Jan. 22, 1929 |
| 2,016,290 | Morris .....        | Oct. 8, 1935  |
| 2,281,860 | Renault .....       | May 5, 1942   |
| 2,303,380 | Naftali et al. .... | Dec. 1, 1942  |
| 2,387,282 | Neumair et al. .... | Oct. 23, 1945 |
| 2,530,786 | Rose .....          | Nov. 21, 1950 |