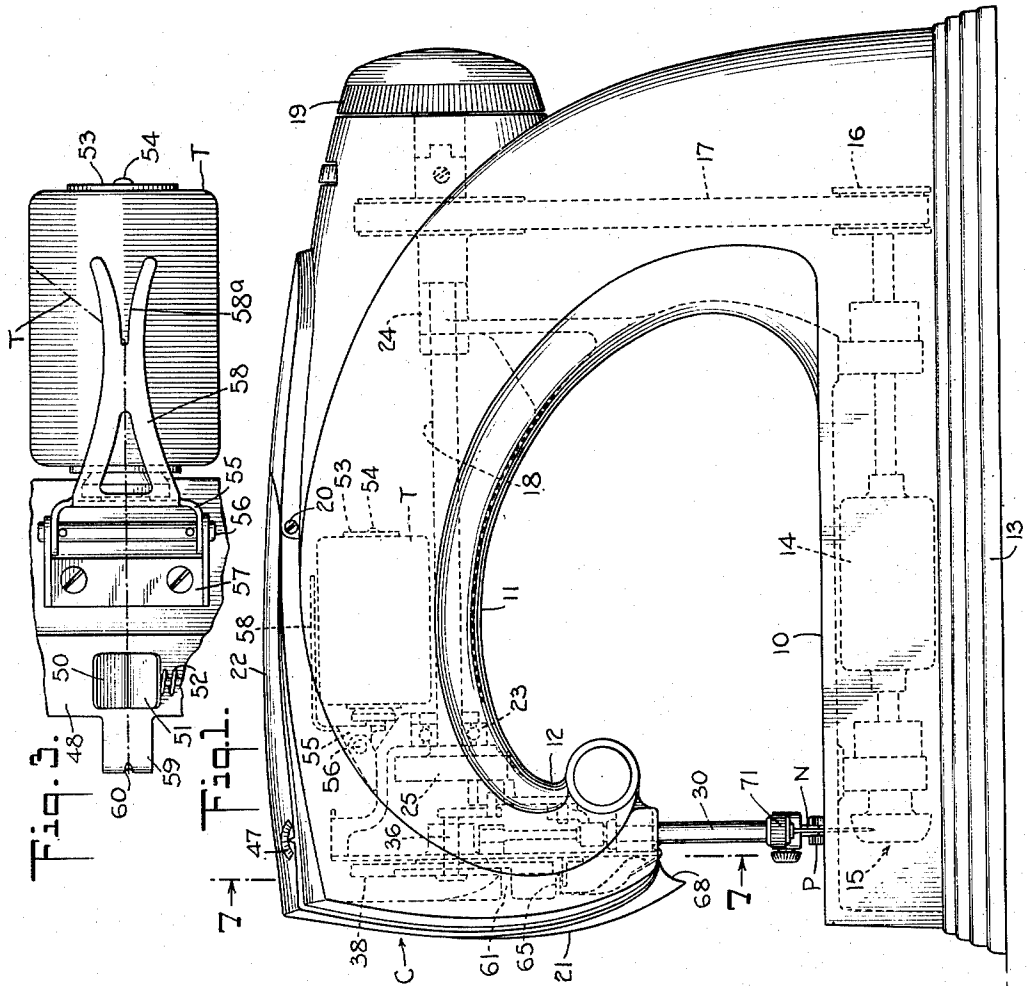
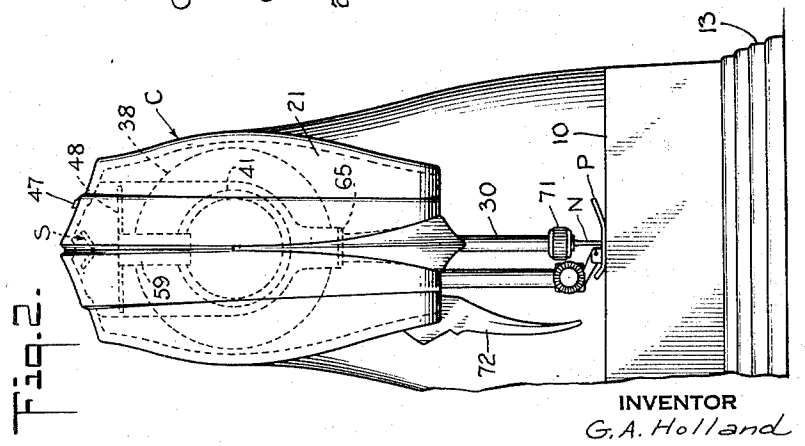
Aug. 1, 1950 G. A. HOLLAND 2,516,874

SEWING MACHINE TAKE-UP

Filed Nov. 23, 1945 5 Sheets-Sheet 1





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Fig. 4.

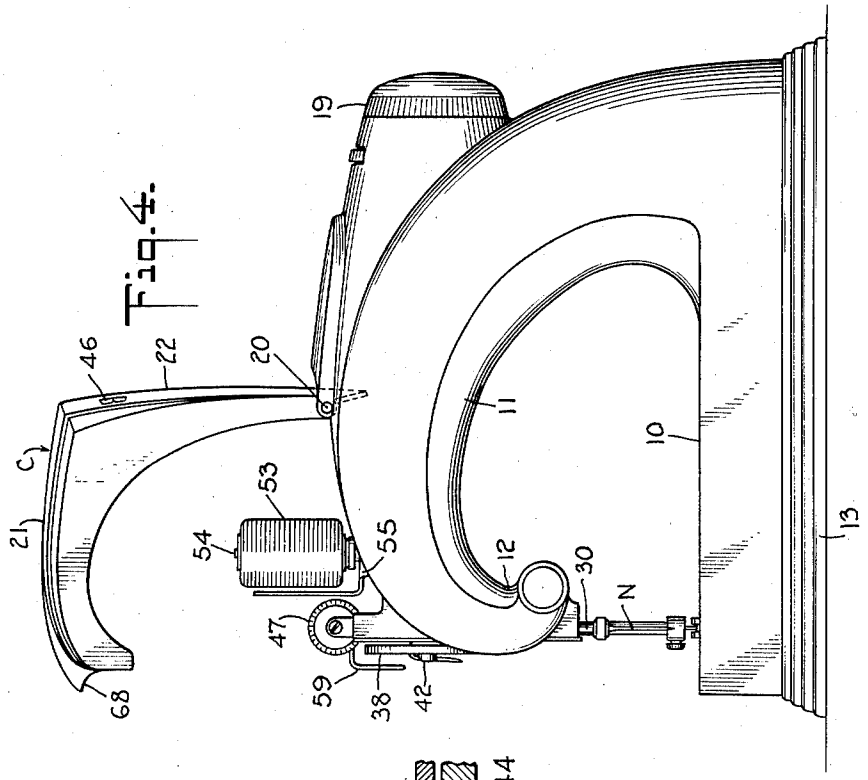


Fig. 6.

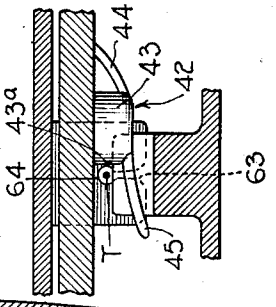
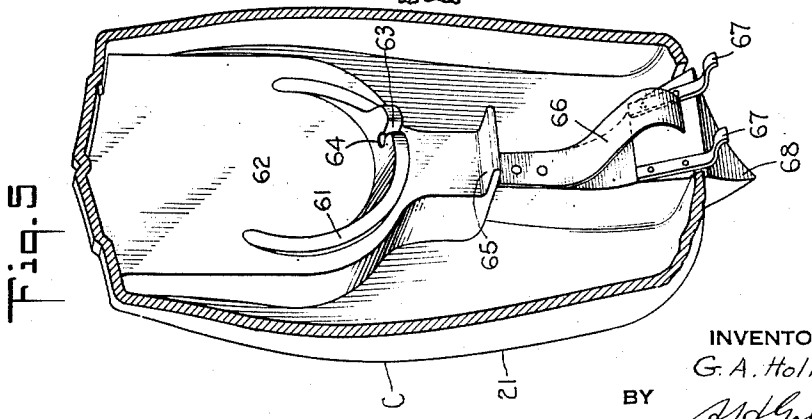


Fig. 5



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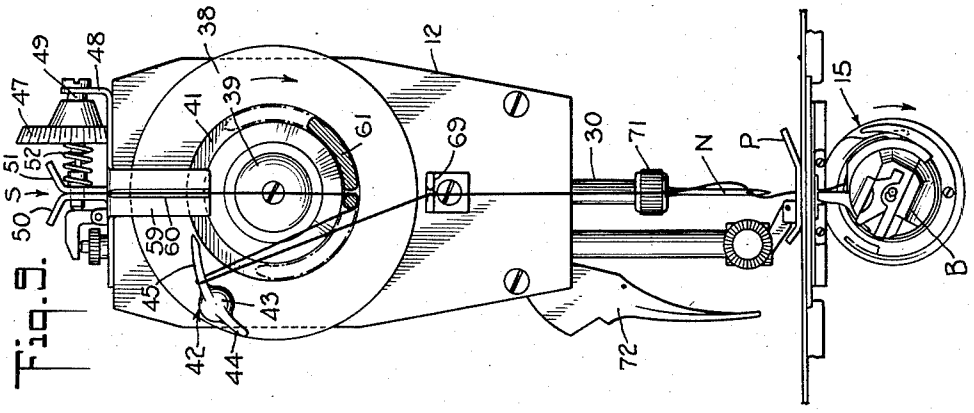


Fig. 5.

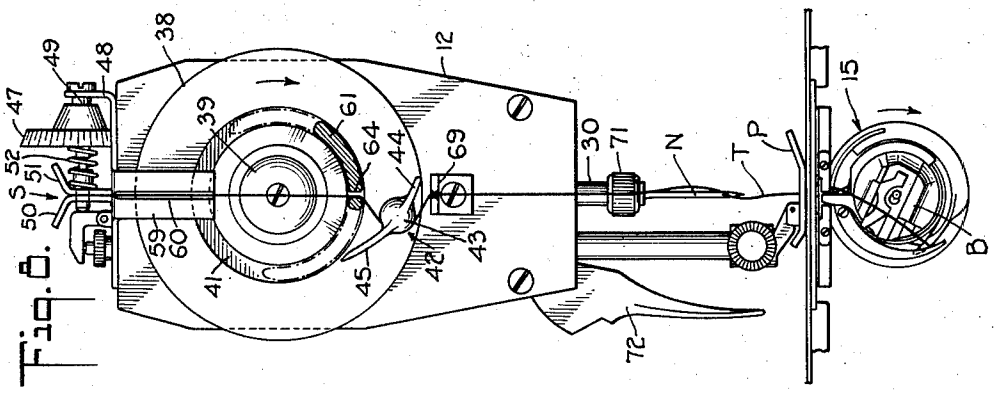


Fig. 6.

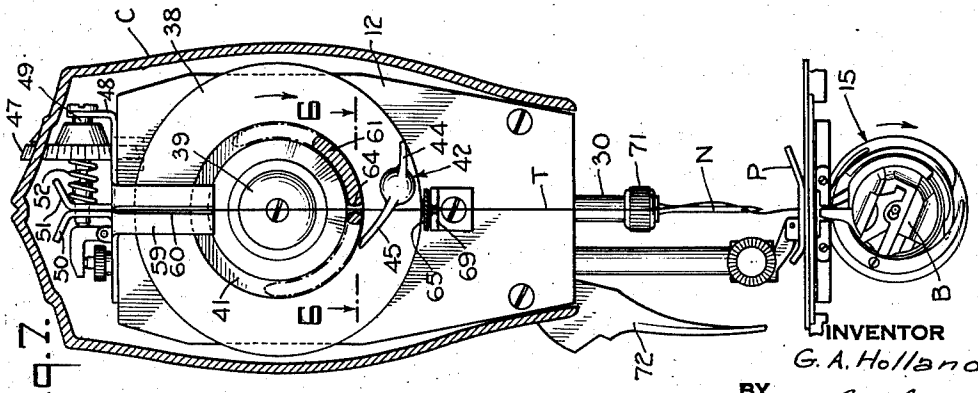


Fig. 7.

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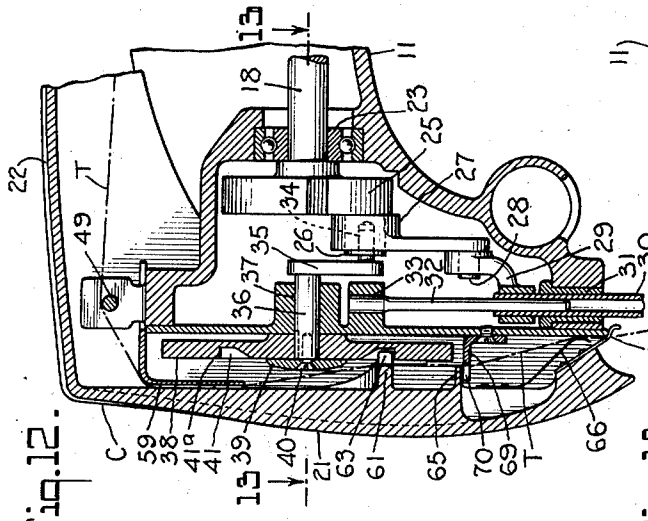


Fig. 12.

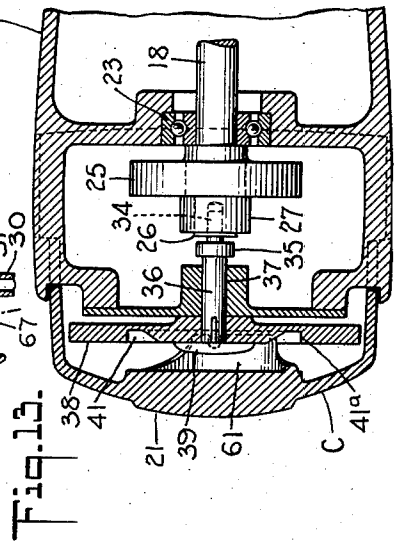


Fig. 13.

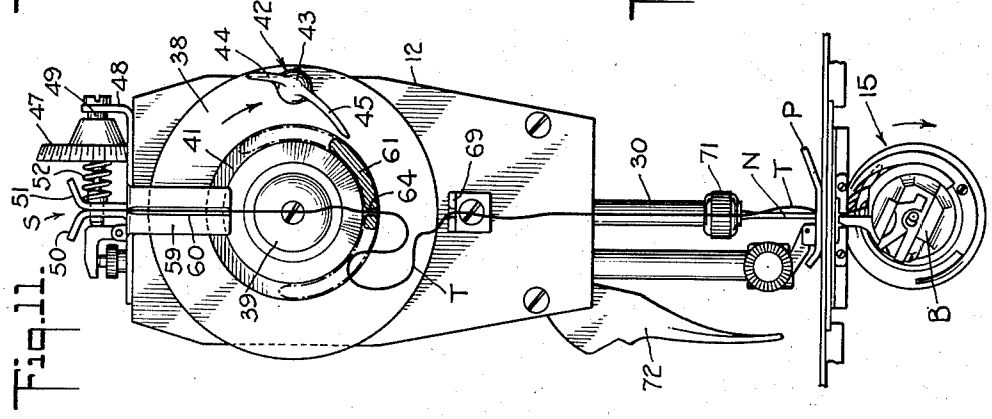


Fig. 11.

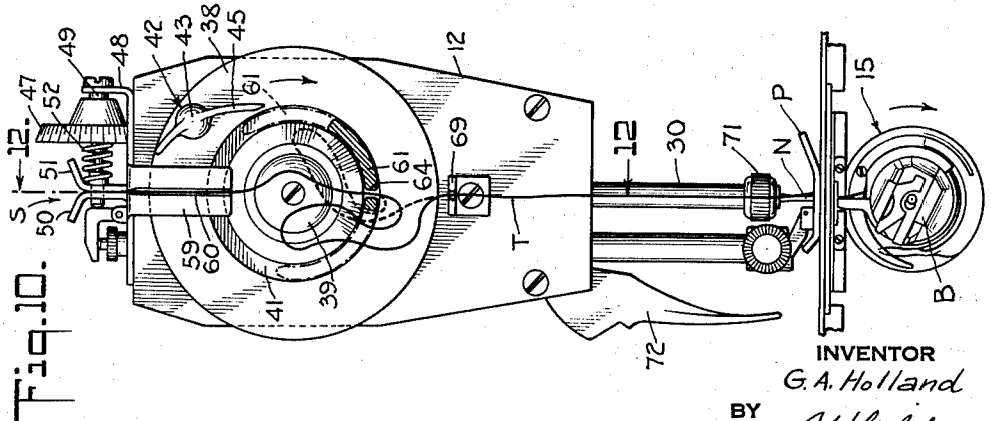


Fig. 10.

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Fig. 16.

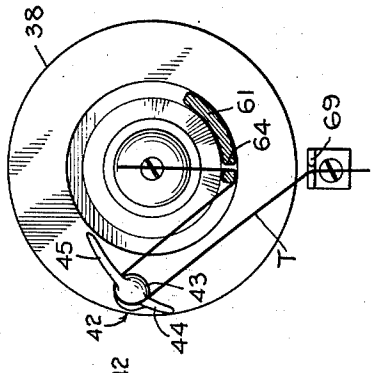


Fig. 17.

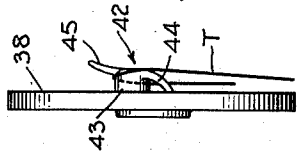


Fig. 20.

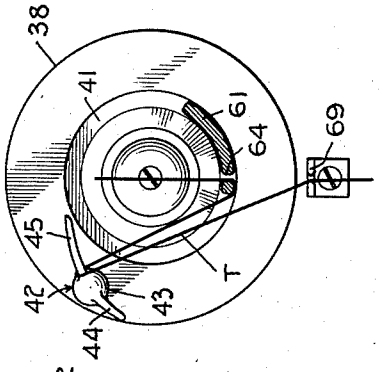


Fig. 21.

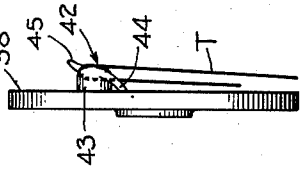


Fig. 14.

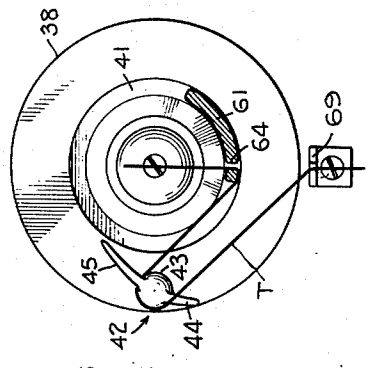


Fig. 15.

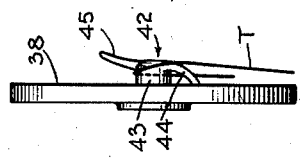


Fig. 18.

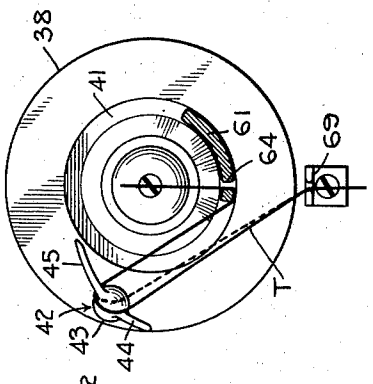
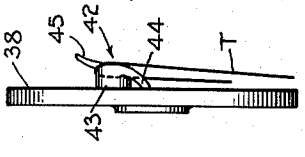


Fig. 19.



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UNITED STATES PATENT OFFICE

2,516,874

SEWING MACHINE TAKE-UP

Glen A. Holland, Bronxville, N. Y., assignor to The Yale & Towne Manufacturing Company, Stamford, Conn., a corporation of Connecticut

Application November 23, 1945, Serial No. 630,288

34 Claims. (Cl. 112—248)

1

This invention relates to a sewing machine, and more particularly, to a sewing machine of the type adapted to be used in a home and known in the trade as a domestic sewing machine.

The art has long sought a machine of this class so constructed that it can be threaded by a simple manipulation of the thread, and without the rather complex and intricate manipulation of the thread that is necessary in present sewing machines. It is the object of my invention to contribute a sewing machine that is easily threaded.

The art has also long sought a domestic sewing machine having a simple rotary take-up. It is the object of my invention to contribute a sewing machine having an extremely simple and effective rotary take-up, and more particularly, a rotary take-up that will allow for the type of threading to which I have alluded.

Inventors in the sewing machine art have for many years attacked the problem of contributing effective rotary take-ups and there are today numerous patents showing rotary take-up mechanisms. However, these rotary take-ups of the prior art do not lend themselves to the type of simple threading that I believe is essential in a domestic sewing machine. In addition, the rotary take-ups of the prior art have a tendency to entrap the thread in the event the thread is broken so as to wind great quantities of thread about the mechanism. This makes it necessary to perform a difficult thread unwinding and disentangling operation each time that the thread is broken. In order to minimize the damage done, thread cutters are provided in sewing machines of the particular class, the thread cutters serving to cut the thread and thereby to prevent the entanglement thereof. However, thread cutters are not entirely satisfactory, and certainly are not desirable in domestic machines.

The take-up mechanisms of the prior art are also relatively complex, it having been found by prior art inventors that it is generally necessary to utilize a pair of thread manipulators working in combination in order to effect proper take-up of the thread. There have been contributed rotary take-ups in which a single take-up member is stripped of its thread at a particular point in its travel, but these take-ups require a manipulation of the thread relatively to the take-up device by additional means that are not adjustable or readily adaptable to the varying operations of a sewing machine. Moreover, such prior art mechanisms do not allow for the proper operation of the take-up mechanism relatively to the tension means for determining the tension of the stitch.

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As a feature of my invention, I contribute a rotary take-up mechanism that is particularly adapted for ready cooperation with a thread placed across its path of movement. Through this feature, my take-up mechanism is readily adaptable for use in a machine of the type in which the thread is moved preferably in a single plane from the spool to the needle, and without any manipulation relatively to auxiliary guide means such as is required generally in the prior art.

As a further feature of my invention, the take-up mechanism is adapted to be self-stripping, so that its mere movement with the thread is effective to move the thread off the take-up at a particular point of the travel of the take-up. In other words, it is inherent in the construction of the take-up that the thread is stripped therefrom at the completion of the take-up stroke.

As a still further feature of this portion of the invention, the take-up has a portion thereof adapted to impart that slight additional pressure to the thread as the thread leaves the take-up, whereby to move the thread relatively to the tension means to contribute a tight stitch as determined by the tension means.

It is a further feature of my invention that the rotary take-up is arranged to rotate through one revolution while the hook of the sewing machine rotates through two revolutions, thus preserving the time-honored relation between the take-up mechanism and the hook, making it possible for my take-up to cooperate with standard hooks of the type that have been giving excellent results for many years.

Still a further feature of the invention resides in the particular relation of the rotary take-up member to guide means for so holding and guiding the thread that once the thread leaves the take-up in a portion of one take-up cycle, the said thread will not be accessible to the take-up member until the very beginning of the next take-up cycle. Still a further feature of the guide means is the arrangement thereof so that the thread is held in the path of a take-up finger to be engaged thereby upon rotation of the take-up finger to the beginning of its take-up stroke, it mattering not where the take-up finger is positioned at the time the thread is placed across its path of travel by the guide means.

Still a further feature of the invention resides in the utilization of a cover member for the head

of the sewing machine, the cover member having guide means for the thread mounted thereon and adapted to move into particular guiding relation to the thread when the cover is applied in position. As a particular feature of this part of the invention, the said guide means on the cover are adapted to form an effective barrier between the take-up finger and the thread, all as will presently appear.

As still a further feature of the invention, the cover is adapted to lie in covering relation not only to the head, but to a portion of the arm of the sewing machine, of which the head is a part. The cover has a part thereof in covering relation to a well in the arm of the sewing machine in which the thread spool may be mounted. The thread from the said spool is then adapted to be led under the cover and downwardly over the head of the machine to the needle so that none of the working parts or the thread are exposed.

As a further feature, a tension member is mounted under the cover and has a portion thereof exposed through an opening in the cover so that it may be readily adjusted.

I have thus outlined rather broadly the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized by those skilled in the art as a basis for the designing of other structures for carrying out the several purposes of my invention. It is important, therefore, that the claims to be granted me shall be of sufficient breadth to prevent the appropriation of my invention by those skilled in the art.

It is also important to consider that while my invention is best utilized as a complete combination, certain parts thereof may be omitted while still leaving an effective operating structure. Thus, the arm of my take-up finger is an important portion thereof and will be claimed, but a finger not having that arm may be sufficiently effective for many operations. Therefore, I feel myself entitled to claims covering sub-combinations of my invention.

Referring now to the drawings, Fig. 1 is a side elevation of my machine, while Fig. 2 is an end elevation thereof. Fig. 3 is a view looking downwardly on a part of the mechanism mounted in a well of the arm of the sewing machine and illustrating particularly certain of the parts shown in dotted lines in Fig. 1. Fig. 4 is a view similar to Fig. 1, but showing the cover in its upper position and with certain of the parts of the machine moved into position for manipulation. Fig. 5 is a perspective view looking at the back of the head covering portion of the cover. Fig. 6 is a section taken along the line 6—6 of Fig. 7. Fig. 7 is a section taken along the line 7—7 of Fig. 1. Figs. 8, 9, 10, and 11 are views similar to Fig. 7, but showing the relationship of the take-up mechanism to the hook in certain positions of the take-up mechanism. Fig. 12 is a vertical section taken substantially along the line 12—12 of Fig. 10. Fig. 13 is a section taken along line 13—13 of Fig. 12. Figs. 14, 16, 18, and 20 are views illustrating the relation of the thread to the take-up mechanism in different positions of that take-up mechanism. Figs. 1, 5, 17, 19, and 21 are side views of Figs. 14, 16, 18, and 20, respectively.

Referring now more particularly to the drawings, and especially to Figs. 1 and 4, my sewing machine comprises a base member 10 that is formed integrally with an upper arm 11 carrying what I term a head 12 formed as a part thereof. The base of the machine is formed so that a rubber pad 13 may be secured thereto for the purpose of holding the machine against slippage on a smooth surface and for dampening vibrations. Within the base of the machine 10 there is mounted a suitable electric motor 14 that drives a conventional hook 15, the motor being effective through a pulley 16 and a belt 17 to drive an upper shaft 18 at a speed one-half the speed of the hook 15. A hand wheel 19 that conforms to the general shape of the machine is secured to the shaft 18 for imparting rotation thereto when desired.

For covering the head 12 and the forward portion of the arm 11, I utilize a cover member designated by the letter C and pivoted on a shaft 20 relatively to the arm 11. The cover C has a part 21 that is adapted to cover the head 12 and a part 22 adapted to cover a well formed in the arm 11 of the machine. In the position of the cover C in Fig. 4, both the well of the machine and the head 12 are exposed.

Referring now to Fig. 12, there is shown a forward bearing 23 for the upper shaft 18, the rear end of the said shaft being supported by a bearing 24 as best seen in Fig. 1. A disc 25 is preferably formed as an integral part of the shaft 18 and carries an eccentric stud 26 about which is mounted the crank 27. This crank 27 extends downwardly and terminates in a pin 28 that is in driving relation to an arm 29 that is formed as an integral part of the needle bar 30 of my machine. This needle bar is suitably guided by a sleeve bearing 31, and also by a pin 32 that is secured at 33 to a part of the head. It will now be readily appreciated that rotary motion of the shaft 18 will contribute reciprocation of the needle bar 30 for a purpose that is quite well known and understood in the art.

The eccentric stud 26 that is rotated with the disc 25 and shaft 18, is bored for a pin 34 that is part of a crank arm 35 secured to a rotary shaft 36 mounted for rotation in a bearing 37. Splined to the shaft 36 is a take-up disc 38 that is held thereto by a washer 39 and a screw 40. The take-up disc 38 is thus adapted to be rotated at the same speed as shaft 18, or one revolution for each reciprocation of the needle bar 30 and each two revolutions of the hook 15, all for a purpose that will be understood by the experts in this art.

A circular groove 41 is formed in the take-up disc 38, the section of this groove being probably best shown in Figs. 12 and 13. The function of this groove will be described presently. Secured on the take-up disc 38 is what I term a take-up finger designated generally by reference numeral 42. This take-up finger is well illustrated in the drawings and especially in such Figures as 6, 7, and 14 to 21. The take-up finger 42 has a main domed part bearing reference numeral 43, and extending rearwardly from the domed part is a camming or stripping member 44. Extending forwardly from the domed main part of the finger 43 is an arm 45. The functioning of the parts of the finger will appear presently.

The part 22 of the cover C is formed with an

opening 46 through which is accessible the adjusting wheel 47 of a spring tension mechanism designated generally by the letter S. This tension mechanism lies under the cover C, but is accessible when the cover is moved to its position of Fig. 4. The construction of the tension mechanism per se is not part of the invention to be claimed specifically in this application and it will, therefore, not be described in detail. However, those skilled in the art will understand the construction very readily from the drawings and the simple description to be presented. A bracket 48 is mounted on the head of the machine and supports a shaft 49, the other end of which is supported by a bent plate 50. Cooperating with the plate 50 is a second plate 51 that is adapted for sliding motion on the shaft 49 and to be maintained by a spring 52 pressed against the plate 50. The pressure of the spring 52 is, of course, adjusted by rotation of the adjusting wheel 47, the said wheel being threaded on a portion of the shaft 49 for axial movement thereon, and the spring being itself mounted about the shaft 49. The amount of spring pressure will determine the tension applied to the thread T that passes between plates 50, 51 as probably best seen in Fig. 12.

The thread T is wound about a spool 53 that is applied to a supporting pin 54 extending from a bracket 55 that is pivoted on a shaft 56 in turn supported by a bracket 57 secured within the well of the arm 11 of the machine. It will be understood that the spool 53 is applied to the pin 54 when the bracket 55 is moved out of the well to its position of Fig. 4. Thereafter, the bracket may be rotated on the shaft 56 to its position shown in dotted lines in Fig. 1 and within the well of the arm 11. A suitable guide plate 58 is formed as an integral part of the bracket 55 and is adapted to guide the thread T from the spool 53 so that it will be centered relatively to the head of the machine and may be readily applied between the two bent plates 50, 51 of the spring tension mechanism S.

Formed integrally with the bracket 48 that supports part of the tension mechanism, is a downwardly extending guide plate 59 that is preferably grooved at 60 to hold the thread T in guided relation thereto. It will be noted especially from Figs. 4 and 12 that a thread moved longitudinally of the machine from the spool 53 and then dropped vertically downwardly along the plate 59 will lie outwardly of the take-up disc 38 and the take-up finger 42 so that the finger may rotate relatively to the thread without contacting it. It is, of course, necessary, while maintaining the thread preferably in the plane of the groove 60 of the plate 59, to bring the thread into the path of movement of the take-up finger 42. This is accomplished through additional guide means preferably carried on the cover C, and now to be described.

Referring to Fig. 5, the portion 21 of the cover C that covers the head of the machine has formed on its inside face a guide wall 61. This guide wall 61 extends for part of the circumference of a circle and tapers at its ends into the surface 62 of the cover 21. The extreme lower periphery of the wall 61 is formed with a slot 63 leading to a bore 64 through which the thread T is adapted to pass. The surface 62 below wall 61 extends into a guide shelf 65, and carries also a guide spring 66. Holding springs 67 are also secured to the cover C for the purpose of holding it yieldingly in covering relation to the head 12 of the machine. A finger piece 68 formed as part of cover C is adapted for the application of the fingers to move the cover from covering position to its position of Fig. 4.

The guide wall 61 is adapted, when the cover is in its position of Figs. 1, 12 and 13 to lie within the groove 41 of the take-up disc 38. It will be seen from the figures referred to that the wall 41a of the groove 41 will cooperate with the wall 61 to present a barrier against the movement of the thread T out of the guide bore 64 and slot 63 within the wall 61. Moreover, with the thread merely positioned within the groove 60 of the plate 59 and extending freely downwardly toward the needle N carried by the needle bar 30 as best seen in Fig. 7, the movement of the cover into covering position will bring the slot 63 of wall 61 in encompassing relation to the thread T. Final snapping of the cover C into position as in Fig. 12, through action of springs 67, will bring the thread T into the bore 64 and vertically inwardly of the machine so that the thread T just below bore 64 lies in the path of the finger 42, as probably best seen in Fig. 6.

It is not only the function of the wall 61 to form through its bore 64 and slot 63 a guide for the thread, but also to form a protected zone into which the thread may move when it is stripped from the take-up finger in a manner to be described. Thus, as will appear, the thread is dropped into a zone in which it is protected by the wall 61 against moving into the path of the take-up finger after the finger has been stripped of the thread and is moving toward the beginning of a second take-up cycle.

It will be noted that below the take-up disc 38 in Fig. 12 there is secured on the head a thread guiding bracket 69 slotted at 70 for the entry of the thread T. The thread is maintained within the slot 70 by the shelf 65 formed on the cover C. From the slot 70 the thread moves under the wide spring 66 referred to in connection with Fig. 5, and thence downwardly to the needle N secured by a fastening member 71 to the needle bar 30.

The take-up mechanism is, of course, cooperable with a hook 15 within which is mounted a bobbin B for furnishing the thread that forms lock stitches with the thread T. It is, of course, the function of the hook to engage and take up the thread from the take-up mechanism after it is stripped therefrom, and it is the function of the take-up mechanism to take-up the thread thereafter from the hook 15 so as to form a stitch under the control of the spring tension device S. A presser foot P is used as part of the machine and is controlled by a lever 72 in a manner which those skilled in the art will fully appreciate.

I shall now describe the operation of my sewing machine, and the manner in which the thread T is applied thereto without the complex manipulations required by prior art mechanisms. Starting with the machine in the condition shown in Fig. 1, but with no thread therein, the first step necessary is to place the finger of the hand under the surface 68 to swing the cover C upwardly to its position of Fig. 4. The bracket 55 is then moved outwardly of the well of the arm 11 from its position of Fig. 1 to its position of Fig. 4, and a spool 53 of thread T is applied to the pin 54 that is formed as part of the bracket 55. Then the spool may be moved with the bracket into the dotted line position of Fig. 1. The thread is passed into the slot 58a of the guide member 58 and then longitudinally and centrally of the ma-

chine between the spring tension plates 50, 51 of the spring tension mechanism.

The adjustment of the spring tension mechanism is made by wheel 47, the said wheel being available for manipulation when the cover is in its position of Fig. 1 or in its position of Fig. 4. From the spring tension mechanism the thread is moved downwardly in the groove 60 of the guide plate 59 and into the hole of the needle N. The thread will now be in the vertical alignment shown in Fig. 7, but not in the particular relation to the take-up finger 42 that is there illustrated. The cover C is now swung downwardly into place until its springs 57 yieldingly secure it in the position of Fig. 12. The wall 61 will now be within the groove 41 of the take-up disc 38 and the slot 63 will have encompassed the thread T with the thread moving into the vertical bore 64. The shelf 65 will overlie the slot 70 in the guide bracket 69 so as to maintain the thread within the slot 70. Flat spring 66 will press the thread yieldingly into the position illustrated in Fig. 12.

The positions of the parts of the mechanism will be that shown in Fig. 7 when the take-up stroke begins. Thus, as seen in Fig. 7, the take-up finger 42 begins a take-up cycle by bringing its arm 45 into overlying relation to the thread T. This is also approximately the relation of the parts in Fig. 6. The surface 43*a* of the domed portion 43 of the take-up detent 42 will next contact the thread T and upon further rotation of the finger will move the thread to the position of Fig. 8 from the position of Figs. 6 and 7. It will be noted that the hook is now giving up its thread to the take-up finger. Further rotation of the take-up finger from the position of Fig. 8 will bring it into the position of Figs. 14 and 15 relatively to the thread T. It will now be noted that the stripping and camming surface 44 of the finger 42 has contacted the thread and has already proceeded to move it away from the surface 43*a* of the domed portion 43 of the take-up finger. In other words, the surface 44 is beginning to impart a stripping action to the thread while the thread is being taken up.

The next position of the take-up finger 42 relatively to the thread is illustrated in Figs. 16 and 17. There, while the rotation from Figs. 14 and 15 has been very slight, the surface 44 has nevertheless contributed considerable stripping movement to the thread T and the thread is almost ready to leave the domed portion 43 to be engaged by the arm 45. Of course, in this position of the parts, the hook 15 is still giving up its thread for forming a lock stitch. From the position of Figs. 16 and 17, the take-up finger moves to the position of Figs. 18 and 19. In that position the finger is rotated but a slight degree from its position of Fig. 16, but the thread is now moving rapidly off the domed member 43. This movement is so rapid that one side of the thread T is shown in Fig. 18 by a solid line and also by a dotted line to denote swift movement, the last position of the thread being shown by the dotted line.

In Figs. 20 and 21 the finger 42 is shown after a few degrees of rotation from the position of Fig. 18. Now the thread has moved entirely off the domed portion 43 of the take-up finger 42. At this point, the hook 15 has almost given up all of its thread and the end of the take-up stroke has almost been reached. In Fig. 9 we come to that part of the take-up cycle where the hook has given up all its thread and the take-up finger is completing the take-up stroke and moving thread relatively to the spring tension mechanism. Thus, it is during this last part of the stroke of the take-up mechanism that thread is pulled from the spool under the control of the tension mechanism, and it is in this way that the tension mechanism controls the stitch. Therefore, if the tension mechanism is lightly applied, the take-up device will pull the thread rather easily and the stitch will be loose. On the other hand, if the tension on the thread is increased, then it will take considerable force to move the thread relatively to the tension mechanism and the stitches will be tight. The stripping motion of the thread relatively to the finger is closely related to a snapping action, the thread stripping swiftly off the arm of the finger at the completion of the take-up stroke, and just following the last movement of the thread relatively to the tension mechanism.

When the thread has moved off the arm 45 it falls loosely somewhat as indicated in dotted lines in Fig. 10, it moving then very rapidly toward the position shown in the solid line of Fig. 10. It will be noted that as the thread falls loosely it is protected by the wall 61 from contact with the arm 45 of the take-up finger. The effect is to shield the thread from the take-up finger 42 so that the finger will not again contact the thread until the finger moves to its position of Fig. 7 to begin a new take-up cycle. In Fig. 11 we see the hook 15 moving the thread T downwardly and we observe the take-up finger 42 approaching the beginning of its next take-up stroke or cycle. In Fig. 7 the take-up finger is at the beginning of its stroke and is ready to begin a second operation.

It will be well to emphasize at this point that because of the construction of the take-up finger, a natural and effective stripping action takes place just as the finger completes an effective take-up revolution. It will be noted further that the stripping action of the finger will not in any way interfere with the application of the proper tension to the thread and the proper movement of the thread relatively to the tension mechanism at the completion of the take-up stroke. It will further be understood that it is not possible for the thread to be entangled or caught by the take-up finger in the event of the breaking of the thread.

Because of the relationship of the parts and the construction of my take-up, I do not need a cutter mechanism for preventing the winding of the thread by the take-up in the event of the breaking of the thread. The practically automatic threading of my machine should also now be evident.

I believe that those skilled in the art will fully appreciate the great merit that is inherent in my machine.

I now claim:

1. In a sewing machine of the class described, a sewing head, a take-up mechanism comprising a rotating take-up finger rotatably mounted on said sewing head, means guiding a thread so that it extends across the rotary path of said take-up finger to be taken up by said finger, said guide means being open outwardly and transversely of the path of alignment of said thread by said guide means to allow outward transverse removal and replacement of said thread relatively to said guide means, a self-stripping surface formed as a part of said take-up finger for contacting the thread upon rotation of said finger and for stripping the thread completely off said finger as said finger rotates whereby to leave said

thread in a slack condition and means whereby the slack of said thread is then taken up and said thread is moved freely of said finger into a position across the rotary path of said take-up finger.

2. In a sewing machine of the class described, a take-up mechanism comprising a rotating take-up finger mounted for rotation on a horizontal axis, means guiding a thread so that it extends substantially diametrically across the rotary path of said take-up finger to be taken up by said finger, said finger contacting said thread when said finger reaches its lowermost position relatively to said axis and having a generally tapering thread contacting surface that is self-stripping as said finger rotates toward its uppermost position relatively to said axis and exerts take-up pull on said thread, whereby said thread strips off said finger as said finger moves to substantially said uppermost and full take-up position and leaves said finger as it passes through full take-up position, and a hook for taking up said thread and positioning it once again across the path of said finger.

3. In a sewing machine of the class described, a take-up mechanism comprising a rotating take-up finger, means guiding a thread so that it extends across the rotary path of said take-up finger to be taken up by said finger, said finger having a self-stripping surface that contacts the thread upon rotation of said finger to strip the thread therefrom, a self-stripping retaining arm formed as part of said finger and engaged by the thread stripped from said finger surface as said take-up finger rotates to full take-up position, said thread then stripping off said retaining arm as said finger rotates beyond full take-up position.

4. In a sewing machine of the class described, a take-up mechanism comprising a rotating take-up finger, means guiding a thread so that it extends across the rotary path of said take-up finger to be taken up by said finger, said finger having a self-stripping surface and also a retaining arm that overlies the thread in advance of the surface of said finger striking the thread, the pull on said thread by said finger as it continues to rotate after striking said thread tending through said self-stripping surface to pull said thread off said finger and on to said retaining arm until said take-up finger reaches full take-up position, further rotation of said finger and its retaining arm pulling said thread off the end of said arm in the direction of rotation of said finger and arm.

5. In a sewing machine of the class described, a sewing head, a rotary take-up finger, a rotary bobbin hook, means mounting said finger on said sewing head for rotation about a fixed axis parallel to the axis of said bobbin hook, guide means on said head for guiding a thread so that it lies substantially diametrically of the circular path of said take-up finger when it is substantially fully accepted by said bobbin hook and said take-up finger is about to contact said thread to begin the take-up stroke, said guide means being open outwardly and transversely of the path of alignment of said thread by said guide means to allow outward transverse removal and replacement of said thread relatively to said guide means, said finger having a generally tapering thread contacting surface that is self-stripping as said finger rotates and exerts take-up pull on said thread, whereby said thread tends to strip off said finger as said finger moves to full take-up position and then leaves said finger as it passes through full take-up position.

6. In a sewing machine of the class described, a rotary take-up finger, a rotary bobbin hook, means mounting said finger and hook for rotation on parallel horizontal axes vertically spaced with said take-up finger above said bobbin hook, a needle bar carrying a needle at its lower end, means mounting said needle bar for vertical reciprocation, a tension member positioned vertically above said take-up finger, thread guiding means for guiding said thread so that when it is substantially fully accepted by said bobbin hook and about to be contacted by said finger take-up it will extend from said tension member substantially diametrically across the circular path of said take-up finger and toward the needle in substantially a single plane, said guide means open outwardly and transversely of the path of alignment of said thread by said guide means to allow outward transverse removal and replacement of said thread relatively to said guide means, said finger having a generally tapering thread contacting surface that is self-stripping as said finger rotates and exerts take-up pull on said thread, whereby said thread tends through contact with said self-stripping surface to strip off said finger as said finger moves to full take-up position and then leaves said finger as it passes through full take-up position.

7. In a sewing machine of the class described, a take-up mechanism comprising a rotating take-up finger, said finger having a surface that first contacts the thread moving it in a take-up direction as the finger rotates, the continued rotation of said finger moving a tapering and camming surface of said finger against said thread so that the continued pull on the thread incidental to the take-up thereof will tend to strip said thread from said finger because of the action of said tapering and camming surface on said thread, the rotation of said finger through its take-up position acting to fully strip said thread therefrom, and said tapering and camming surface being formed so that the total rotation of said take-up mechanism from its point of contact to the point where the thread is stripped from said surfaces is approximately between 145° and 175°.

8. In a sewing machine of the class described, a take-up mechanism, means for rotating said take-up mechanism, means guiding a thread so that it extends across the rotary path of said take-up mechanism to be taken up thereby, said take-up mechanism having a first surface that first contacts the thread to move it in a take-up direction, said take-up mechanism having a second surface that is tapered in a direction to cam the thread off said first surface as said second surface rotates, the said second surface contacting the thread only after some rotation of said take-up mechanism has taken up some of said thread through action of said first surface, and the continued pull on the thread incidental to the take-up thereof stripping the thread from said surfaces, the total rotation of said take-up mechanism from its point of contact to the point where the thread is stripped from said surfaces being approximately between 145° and 175°.

9. In a sewing machine of the class described, a take-up mechanism comprising a rotating take-up finger, means guiding a thread so that it extends across the rotary path of said finger to be taken up thereby, said finger having a surface that first contacts the thread moving it in a take-up direction as the finger rotates, the continued

rotation of said finger moving a tapering and camming surface thereof against said thread so that the continued pull on the thread incidental to the take-up thereof will tend to strip said thread from said finger because of the action of said tapering and camming surface on said thread, a self-stripping retaining arm on said finger extending in the direction of its rotation, the continued rotation of said finger to its take-up position acting to pull the thread off said finger surface and onto said retaining arm until said take-up finger reaches full take-up position, further rotation of said finger and its retaining arm pulling said thread off the end of said arm in the direction of rotation of said finger and arm.

10. In a sewing machine of the class described, a take-up mechanism, means for rotating said take-up mechanism, means guiding a thread so that it extends across the rotary path of said take-up mechanism to be taken up thereby, said take-up mechanism having a first surface that first contacts the thread to move it in a take-up direction, said take-up mechanism having a second surface that is tapered in a direction to cam the thread off said first surface as said second surface rotates, the said second surface contacting the thread only after some rotation of said take-up mechanism has taken up some of said thread through action of said first surface, a self-stripping retaining arm formed as part of said take-up mechanism extending in the direction of its rotation, the continued rotation of said take-up mechanism to its take-up position acting through said second surface to pull the thread off said first two surfaces and onto said retaining arm until said take-up mechanism reaches full take-up position, further rotation of said take-up mechanism pulling said thread off the end of said arm in the direction of rotation of said take-up mechanism.

11. In a sewing machine of the class described, a sewing head, a rotary bobbin hook, a rotary take-up mechanism mounted on said sewing head comprising a rotary take-up finger, means for rotating said take-up mechanism on said sewing head on an axis parallel to the axis of rotation of said bobbin hook, guide means on said sewing head for guiding a thread so that it lies substantially diametrically of the circular path of said take-up finger when it is substantially fully accepted by said bobbin hook and said take-up finger is about to contact said thread to begin the take-up stroke, said guide means being open outwardly and transversely of the path of alignment of said thread by said guide means to allow outward transverse removal and replacement of said thread relatively to said guide means, said finger having a surface that first contacts the thread moving it in a take-up direction as the finger rotates, the continued rotation of said finger moving a tapering and camming surface thereof against said thread so that the continued pull on the thread incidental to the take-up thereof will tend to strip said thread from said finger because of the action of said tapering and camming surface on said thread, and the rotation of said finger through its take-up position acting to fully strip said thread therefrom.

12. In a sewing machine of the class described, a sewing head, a rotary take-up finger, a rotary bobbin hook, means mounting said finger and hook for rotation on parallel horizontal axes vertically spaced with said take-up finger on said sewing head and above said bobbin hook, a needle bar carrying a needle at its lower end, means mounting said needle bar for vertical reciprocation, a tension member positioned vertically above said take-up finger, thread guiding means for guiding said thread so that when it is substantially fully accepted by said bobbin hook and about to be contacted by said take-up finger it will extend from said tension member substantially diametrically across the circular path of said take-up finger and toward the needle in substantially a single plane, said guide means being open outwardly and transversely of the path of alignment of said thread by said guide means to allow outward transverse removal and replacement of said thread relatively to said guide means, said finger having a surface that first contacts the thread moving it in a take-up direction as the finger rotates, the continued rotation of said finger moving a tapering and camming surface thereof against said thread so that the continued pull on the thread incidental to the take-up thereof will tend to strip said thread from said finger because of the action of said tapering and camming surface on said thread, and the rotation of said finger through its take-up position acting to fully strip said thread therefrom.

13. In a sewing machine of the class described, a rotary take-up finger, a rotary bobbin hook, means mounting said finger and hook for rotation on parallel horizontal axes vertically spaced with said take-up finger above said bobbin hook, a needle bar carrying a needle at its lower end, means mounting said needle bar for vertical reciprocation, a tension member positioned vertically above said take-up finger, thread guiding means for guiding said thread so that when it is substantially fully accepted by said bobbin hook and about to be contacted by said take-up finger it will extend from said tension member substantially diametrically across the circular path of said take-up finger and toward the needle in substantially a single plane, said take-up mechanism having a first surface that first contacts the thread to move it in a take-up direction, said take-up mechanism having a second surface that is tapered in a direction to cam the thread off said first surface, the said second surface contacting the thread only after some rotation of said take-up finger has taken up some of said thread through action of said first surface, a self-stripping retaining arm formed as part of said take-up mechanism extending in the direction of its rotation, the continued rotation of said take-up mechanism to its take-up position acting through said second surface to pull the thread off said first two surfaces and onto said retaining arm until said take-up mechanism reaches full take-up position, further rotation of said take-up mechanism pulling said thread off the end of said arm in the direction of rotation of said take-up mechanism.

14. In a sewing machine of the class described, a head, a take-up disk having take-up means thereon, means mounting said disk for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation, thread guiding means on said head, a second thread guiding means on the inside of said cover movable into thread guiding position against said thread when said cover moves into covering relation to said head whereby thread is then guided between said head and cover, the thread guiding means of said cover being positioned radially immediately inwardly of the path of rotation of said take-up means on

said take-up disk so that said take-up means contacts the thread just radially beyond said guide means on the cover.

15. In a sewing machine of the class described, a head, a take-up finger, means mounting said finger for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation, thread guiding means on said head, a second thread guiding means on the inside of said cover movable into thread guiding position against said thread when said cover moves into covering relation to said head whereby thread is then guided between said head and cover, the thread guiding means of said cover being positioned radially immediately inwardly of the path of rotation of said take-up finger so that said take-up finger contacts the thread just radially beyond said guide means on the cover.

16. In a sewing machine of the class described, a head, a take-up disk having take-up means thereon, means mounting said disk for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation, thread guiding means on said head, a second thread guiding means on said cover movable into thread guiding position when said cover moves into covering relation to said head whereby thread is then guided between said head and cover, the thread guiding means of said cover being positioned radially immediately inwardly of the path of rotation of said take-up means on said take-up disk so that said take-up means contacts the thread just radially beyond said guide means on the cover, said guide means on said cover extending into co-action with a circumferential wall of said take-up disk to form a barrier against the movement of the thread beyond said cover guide means except through said guide means.

17. In a sewing machine of the class described, a head, a rotary take-up means, means mounting said rotary take-up means for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation to said head, a first thread guiding means on the upper portion of said head above the path of said take-up means, a second thread guiding means on said cover movable into thread guiding position when said cover moves into covering relation to said head, said thread guiding means on said cover being then positioned below said first guide means and below the axis of rotation of said rotary take-up means and radially just inwardly of said take-up means.

18. In a sewing machine of the class described, a head, a rotary take-up means, means mounting said rotary take-up means for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation to said head, a first thread guiding means on the upper portion of said head above the path of said take-up means, a second thread guiding means on said cover movable into thread guiding position when said cover moves into covering relation to said head, said thread guiding means on said cover being then positioned below said first guide means and below the axis of rotation of said rotary take-up means and radially just inwardly of said take-up means, whereby said take-up means will rotate to pick up thread that has just moved through said second guide means, and wall means formed for cooperation with said second guide means to form a barrier between a part of the path of said rotary take-up means and a part of the area lying inwardly of said wall means and second guide means.

19. In a sewing machine of the class described, a head, a takeup disk having take-up means thereon, means mounting said disk for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation, thread guiding means on said head, a second thread guiding means on said cover movable into thread guiding position when said cover moves into covering relation to said head whereby thread is then guided between said head and cover guide means, the second thread guiding means being positioned radially immediately inwardly of the path of rotation of said take-up means on said take-up disk so that said take-up means contacts the thread just radially beyond said guide means on the cover, and curved walls formed as extensions of said second guide means to form a barrier against movement of the thread from the inner zone defined by said curved walls into the path of movement of said take-up means, said second guide means having a slot through which passes said thread.

20. In a sewing machine of the class described, a head, take-up disk having take-up means thereon, means mounting said disk for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation, thread guiding means on said head, a second thread guiding means on said cover movable into thread guiding position when said cover moves into covering relation to said head whereby thread is then guided between said head and cover guide means, the second thread guiding means being positioned radially immediately inwardly of the path of rotation of said take-up means on said take-up disk so that said take-up means contacts the thread just radially beyond said guide means on the cover, curved walls formed as extensions of said second guide means to form a barrier against movement of the thread from the inner zone defined by said curved walls into the path of movement of said take-up means, said second guide means having a slot through which passes said thread, and said disk having a circular wall juxtaposed to said second guide means whereby as said disk rotates said circular wall forms a closure for the open end of the slot through which said thread passes.

21. In a sewing machine of the class described, a head, a rotary take-up means, means mounting said rotary take-up means for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation to said head, a first thread guiding means on said head, a second thread guide means on said cover movable into thread guiding position when said cover moves into covering relation to said head, said thread guiding means on said cover being then positioned below said first guide means and below the axis of rotation of said rotary take-up means and radially just inwardly of said take-up means, whereby said take-up means will rotate to pick up thread that has just moved through said second guide means, wall means formed for cooperation with said second guide means to form a barrier between a part of the path of said rotary take-up means and a part of the area lying inwardly of said wall means and second guide means, said take-up means comprising a finger having a first surface that contacts the thread just below said second guide means and a second self-stripping sur-

face that contacts the thread and cams it off said finger in a zone above said wall means and into the area inwardly of said wall means.

22. In a sewing machine of the class described, a head, a rotary take-up means, means mounting said rotary take-up means for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation to said head, a first thread guiding means on said head, a second thread guiding means on said cover movable into thread guiding position when said cover moves into covering relation to said head, said thread guiding means on said cover being then positioned below said first guide means and below the axis of rotation of said rotary take-up means and radially just inwardly of said take-up means, whereby said take-up means will rotate to pick up thread that has just moved through said second guide means, and curved walls formed as extensions of said second guide means to form a barrier against movement of the thread from the inner zone defined by said curved walls into the path of movement of said take-up means, said second guide means having a slot through which passes said thread, said take-up means comprising a finger having a first surface that contacts the thread just below said second guide means, and a second self-stripping surface that later contacts the thread and cams it off said finger into the inner zone defined by said wall means.

23. In a sewing machine of the class described, a head, a take-up disk having take-up means thereon, means mounting said disk for rotation on said head, a cover for said head, means pivoting said cover for movement into and out of covering relation, thread guiding means on said head, a second thread guiding means on said cover movable into thread guiding position when said cover moves into covering relation to said head whereby thread is then guided between said head and cover guide means, the second thread guiding means being positioned radially immediately inwardly of the path of rotation of said take-up means on said take-up disk so that said take-up means contacts the thread just radially beyond said guide means on the cover, curved walls formed as extensions of said second guide means to form a barrier against movement of the thread from the inner zone defined by said curved walls into the path of movement of said take-up means, said second guide means having a slot through which passes said thread, said disk having a circular wall juxtaposed to said second guide means whereby as said disk rotates said circular wall forms a closure for the open end of the slot through which said thread passes, said take-up means comprising a finger having a first surface that contacts the thread just below said second guide means, and a second self-stripping surface that later contacts the thread and cams it off said finger into the zone inwardly of said wall means.

24. In a sewing machine of the class described, a head, a take-up mechanism comprising a rotating take-up finger, means mounting said take-up finger on said head for rotation on a horizontal axis, a first thread guide positioned vertically above the circular path of said finger and in a vertical plane spaced from the plane of said finger so that a thread dropped vertically will lie out of the path of said finger, a second guide means mounted on said machine and having a slot through which the thread is passed from said first guide, said second guide lying just above the path of said finger with the thread guided thereby to lie in a vertical plane diametric of the path of said finger and accessible to said finger just below said slot, a third guide means for said thread below the path of said finger, said finger having a generally tapering thread contacting surface that is self-stripping as said finger rotates and exerts take-up pull on said thread, whereby said thread tends to strip off said finger as said finger moves to full take-up position and then leaves said finger as it passes through full take-up position.

25. In a sewing machine of the class described, a head, a take-up mechanism comprising a rotating take-up finger, means mounting said take-up finger on said head for rotation on a horizontal axis, a first thread guide positioned vertically above the circular path of said finger and in a vertical plane outwardly spaced from the plane of said finger so that a thread dropped vertically will lie out of the path of said finger, a second guide means mounted on said machine and having a slot through which the thread is passed from said first guide, said second guide lying just above the path of said finger with the thread guided thereby to lie in a vertical plane diametric of the path of said finger and accessible to said finger just below said slot, a third guide means for said thread below the path of said finger, said finger having a generally tapering thread contacting surface that is self-stripping as said finger rotates and exerts take-up pull on said thread, whereby said thread tends to strip off said finger as said finger moves to full take-up position and then leaves said finger as it passes through full take-up position, and curved walls formed as extensions of said second guide means to form a barrier against movement of the thread from the inner zone defined by said curved walls into the path of movement of said take-up means except through said slot.

26. In a sewing machine of the class described, a head, a take-up mechanism comprising a rotating take-up finger, means mounting said take-up finger on said head for rotation on a horizontal axis, a first thread guide positioned vertically above the circular path of said finger and in a vertical plane spaced outwardly from the plane of said finger so that a thread dropped vertically will lie out of the path of said finger, a second guide means mounted on said machine and having a slot through which the thread is passed from said first guide, said second guide lying just above the path of said finger with the thread guided thereby to lie in a vertical plane diametric of the path of said finger and accessible to said finger just below said slot, a third guide means for said thread below the path of said finger, said finger having a first thread contacting surface and a second generally tapering thread contacting surface that contacts the thread as said finger rotates and strips said thread from said finger as it exerts take-up pulls on said thread, whereby said thread leaves said fingers as the finger rotates through full take-up position less than 180° from the point of first contact with said thread, and a curved wall formed as an extension of said second guide means to form a barrier against movement of the thread from the inner zone defined by said curved wall into the path of movement of said take-up means after said thread is stripped therefrom except through said slot.

27. In a sewing machine of the class described, a head, a take-up mechanism comprising a rotating take-up finger, means mounting said take-

up finger on said head for rotation on a horizontal axis, a first thread guide positioned vertically above the circular path of said finger and in a vertical plane spaced outwardly from the plane of said finger so that a thread dropped vertically therefrom will not lie in the path of said finger, a cover pivoted on said head for movement into and out of cover relation, a second guide means secured on said cover and having a slot adapted to envelop the thread extending from said first guide means as said cover is moved to covering position, said second guide means lying with its slot just above the path of said finger and closer to said head than said first guide means whereby the thread is accessible to said rotary finger just below said slot, a third guide means for said thread below the path of said finger, said finger having a first thread contacting surface and a second generally tapering thread contacting surface that strips the thread from said finger as said finger rotates and exerts take-up pull on said thread, and curved walls formed as extensions of said second guide means to form a barrier against movement of the thread from the inner zone defined by said curved walls into the path of movement of said take-up means except through said slot, said thread moving into said inner zone from said take-up finger as it is stripped from said finger.

28. In a sewing machine of the class described, a head, a take-up mechanism comprising a rotating take-up finger, means mounting said take-up finger on said head for rotation on a horizontal axis, a first thread guide positioned vertically above the circular path of said finger and in a vertical plane spaced outwardly from the plane of said finger so that a thread dropped vertically therefrom will not lie in the path of said finger, a cover pivoted on said head for movement into and out of cover relation, a second guide means secured on said cover and having a slot adapted to envelop the thread extending from said first guide means as said cover is moved to covering position, said second guide means lying with its slot just above the path of said finger and closer to said head than said first guide means whereby the thread is accessible to said rotary finger just below said slot, a third guide means for said thread below the path of said finger, said finger having a first thread contacting surface and a second generally tapering thread contacting surface that strips the thread from said finger as said finger rotates and exerts take-up pull on said thread, and curved walls formed as extensions of said second guide means to form a barrier against movement of the thread from the inner zone defined by said curved walls into the path of movement of said take-up means except through said slot, said thread moving into said inner zone from said take-up finger as it is stripped from said finger, the said finger rotating approximately 145° to 175° from the point of contact with said thread to the point where said thread is stripped therefrom.

29. In a sewing machine of the class described, a head, a take-up mechanism comprising a rotating take-up finger, means mounting said take-up finger on said head for rotation on a horizontal axis, a first thread guide positioned vertically above the circular path of said finger and in a vertical plane spaced from the plane of said finger so that a thread dropped vertically from said guide will not lie in the path of said finger, a cover pivoted on said head for movement into and out of cover relation, a second guide means secured on said cover and having a slot adapted to envelop the thread extending from said first guide means as said cover is moved to covering position, said second guide means lying with its slot just above the path of said finger and closer to said head than said first guide means whereby the thread is accessible to said rotary finger just below said slot, a third guide means for said thread below the path of said finger, said finger having a generally tapering thread contacting surface that is self-stripping as said finger rotates and exerts take-up pull on said thread, whereby said thread tends to strip off said finger as said finger moves to full take-up position and then leaves said finger as it passes through full take-up position, and said rotary take-up finger having a circular wall juxtaposed to said second guide means whereby as said disk rotates said circular wall forms a closure for the open end of the slot through which said thread passes.

30. In a sewing machine, a main frame having the usual horizontally extending arm terminating in a sewing head, a cover for said head, means pivoting said cover on said arm on an axis rearwardly of said head, a well in said arm between said head and said axis covered by a part of said cover, and a thread spool support in said well.

31. In a sewing machine, a main frame having the usual horizontally extending arm terminating in a sewing head, a cover for said head, means pivoting said cover on said arm on an axis rearwardly of said head, said cover having a head covering portion and an arm covering portion angularly related to one another so that said cover may be swung on said axis to bring both cover portions into position, that part of the arm that is covered by said cover having a well therein, and a thread spool support in said well.

32. In a sewing machine, a main frame having the usual horizontally extending arm terminating in a sewing head, a cover for said head, means pivoting said cover on said arm on an axis rearwardly of said head, said cover having a head covering portion and an arm covering portion angularly related to one another so that said cover may be swung on said axis to bring both cover portions into covering position, that part of the arm that is covered by said cover having a well therein, a thread spool support in said well, and guide means for guiding a thread from a spool on said support under said cover and toward said head.

33. In a sewing machine, a main frame having the usual horizontally extending arm terminating in a sewing head, a cover for said head, means pivoting said cover on said arm on an axis rearwardly of said head, a well in said arm between said head and said axis covered by a part of said cover, a thread spool support in said well, a thread guide in said well for guiding the thread, a tension member at said head to which the thread is applied, take-up means on said head to which the thread is led from said tension member, all of said guide means lying under the cover when said cover is in covering position, and said cover having an opening through which extends a part of said tension member when said cover is in place.

34. In a sewing machine of the class described, a sewing head, a cover for said sewing head, a rotary take-up finger, a rotary bobbin hook, means mounting said finger on said sewing head for rotation about a fixed axis parallel to the axis of said bobbin hook, guide means on said head for guiding a thread so that it lies substantially

diametrically of the circular path of said take-up finger when it is substantially fully accepted by said bobbin hook and said take-up finger is about to contact said thread to begin the take-up stroke, said guide means being open outwardly and transversely of the path of alignment of said thread by said guide means to allow outward transverse removal and replacement of said thread relatively to said guide means, said finger having a generally tapering thread contacting surface that is self-stripping as said finger rotates and exerts take-up pull on said thread, whereby said thread tends to strip off said finger as said finger moves to full take-up position and then leaves said finger as it passes through full take-up position, and guide means on said cover holding said thread against said transverse removal from said guide means.

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