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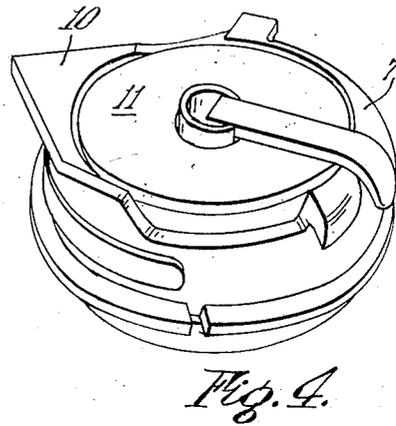
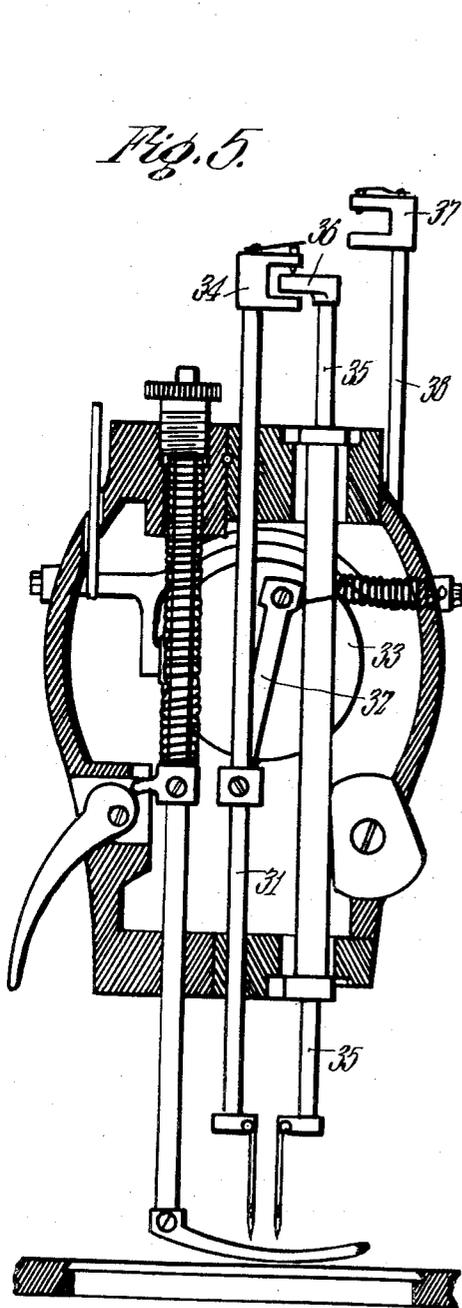
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LOCK-STITCH SEWING MACHINES

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LOCK-STITCH SEWING MACHINES

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In the carrying out of corner stitching on two-needle lock-stitch machines, the needle producing the inner row of stitches is put out of operation by fixing it on its upper position or by turning it aside and the other needle continues stitching for a distance corresponding to the space between the two needles, then the corner is turned and said other needle continues stitching alone, again for a distance equal to the space between the needles, whereafter both needles are brought into operation again.

A disclosure, such as the Brase Patent #1,676,853, issued July 10, 1928, teaches the feature of a two-needle machine wherein one of the needles may be rendered inoperative.

During the time that the inner needle is out of action, the further forward movement of the sewing material causes a length of thread to be drawn from the lower thread bobbin which is associated with the inoperative needle, which thread is not used in sewing. On both needles coming into action again, this unused thread forms a loop at the inner corner, the elimination of which, for the production of neat work, is very desirable, but this however has not been possible up till now without additional manual work.

This defect is obviated by the present invention by the use of a device incorporated in the machine and operated from outside, which makes it possible to rewind the unused lower thread on to the bobbin in the bobbin casing.

The invention provides mechanism operable by the operator of a machine for rewinding on to a bobbin of an inoperative needle unused thread which has been drawn from the bobbin during the time said needle has been inoperative, and according to novel features of the invention such unused thread is rewound on to a bobbin by reverse rotation thereof brought about by driving means which is normally inoperative.

The invention also provides a method of operation of a two-needle lock-stitch machine for stitching sharp corners wherein, after a period of stitching by one needle only, during which unused thread has been drawn from the bobbin below the other needle, such unused thread is rewound on to the bobbin by a reverse rotation of the bobbin through driving means normally in an inoperative position.

The means for re-winding the unused lower thread on to the bobbin is held normally in a non-operative position by means of a spring, and is swung into the working position, and set in operation by means of a single hand crank.

According to a further feature of the invention, the movement transmission from the hand crank is imparted to two shafts separately via slip clutches which are so loaded that they transmit only the forces necessary for the functions of the respective shafts, so that breaking of the thread is avoided. One shaft may be formed as a hollow shaft surrounding the other shaft concentrically and having at its upper end a head plate and at its lower end the hand crank. The hand crank is in addition

movably connected to the driving shaft via a lever arm. This driving shaft has at its upper end a driving wheel which is in working connection with an intermediate wheel located on the said head plate of the pivot shaft. The intermediate wheel transmits the turning movement imparted to it by the driving wheel after pivoting in of the device, to the lower thread bobbin lying in the bobbin casing.

One embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 shows a vertical longitudinal section through the front part of the bottom portion of a sewing machine;

Fig. 2 is a plan view of the mechanism shown in Fig. 1;

Fig. 3 shows the pattern of the lower thread in a stitched corner as carried out in the usual two-needle quilt stitching machine;

Fig. 4 is a perspective view of a bobbin casing with bobbin; and

Fig. 5 is a sectional front view of a sewing machine head to illustrate a known arrangement for sewing with one or two needles selectively.

1 indicates the bottom plate or base of a two-needle lock-stitch machine. This base has a cut out portion 2 which in the sewing area is covered by a needle plate 3 with openings 4 for the passage of the usual feeder and holes 5 for the passage of the needles. A slide 6 adjoins the needle plate 3 for closing the remainder of the opening 2 which slide is omitted in Fig. 2.

A horizontally-rotating loop-taker 7 for a left-hand stitching unit is located in a bracket 8 arranged under the said base plate 1 and is driven in known manner via a skew gear wheel 9. A bobbin casing 10 is located in the loop-taker 7, which casing holds the lower thread bobbin 11. These parts are present in the same or similar form and arrangement in every lock-stitch machine.

The device for the re-winding of the unused lower thread has an outer bearing sleeve 12 which is fixed on the said bracket 8 by means of a foot 13. A hollow shaft 14 is mounted in the bearing sleeve 12, which shaft carries at its upper end a head plate 15. On the lower end of the hollow shaft 14 is a hand crank or control member 16 which is coupled to the hollow shaft only by means of a spring-loaded friction disc or pad 17 acting as a primary slip clutch. The tension of the compression spring 18 is adjustable by means of an adjusting screw 19.

A solid spindle 20 is introduced through the hollow shaft 14 and carries at its upper end a milled edged driving wheel 21. The spindle 20 and hollow shaft 14 constitute inner and outer co-axial members. On the lower end of the shaft a lever 23 is rotatable between friction discs 22 which constitute a secondary slip clutch. The lever is in movable contact with the hand crank 16.

The hollow shaft 14, with the head plate 15 firmly connected to it, is normally held in the neutral position (shown in dot and dash lines in Fig. 2) by means of a coil spring 24 which surrounds the bearing sleeve 12 and is under a turning stress. The spring 24 for this purpose engages with one spring end 25 in the head plate 15 and the other spring end 26 engages the base plate 1. The working position of the device, shown in full lines in Fig. 2, is limited by means of an adjusting screw 27 which is provided in a downwardly bent lug 28 of the head plate 15.

On the head plate 15 is located an intermediate idler wheel 29 which is in driving connection with the driving wheel 21 on the shaft 20. The intermediate wheel 29 is for example formed from a rubber disc which is inserted between upper and lower metal clamping discs. The turning movement of the inner shaft 20 is transmitted via the intermediate wheel 29 to the lower thread bobbin 11, the milled edge of which upon operation of

the device comes into driving connection with the intermediate wheel 29. The bobbin casing 10 has an opening 30 for the entry of the intermediate wheel 29.

In Fig. 5 is illustrated one known construction where-
by one of two needles normally working together may be
held out of operation whenever necessary. Such an il-
lustration is to be found in the aforementioned patent to
Wilhelm Brase, #1,676,853, issued July 10, 1928, and
tilted Sewing Machines With Several Needles. Needle
bar 31 is driven at all times by the connecting rod 32
and crank disc 33. Said needle bar has a yoke member
34 at its top end. The other needle bar 35 is rotatable
in its bearings. It has a lug 36 at its top end which, on
the one hand, may enter said yoke 34, whereby the needle
bar is driven along with its fellow (as shown) or, on
the other hand, the needle bar may be rotated so as to be dis-
engaged from said yoke 34 and entered into a further
yoke 37 mounted on a rod 38 which is fixedly carried by
the head of the machine. In this position, the needle bar
is held out of action.

During the stitching of corners on the usual two-needle
lock-stitch machine, the left-hand needle (innermost of
the corner) is put out of operation and the other operat-
ing needle continues stitching for a distance equal to that
between the needles, then the corner is turned and the
one needle again stitches alone for the said distance. By
the forward movement of the sewing material during the
stitching by the operating needle a corresponding length
of lower thread is drawn from the left-hand lower thread
bobbin such as 11 below the stationary needle, which
length of thread is not used for stitching purposes and,
on re-starting of the left-hand needle, the thread re-
mains as a loop in the corner of the inner row of stitch-
ing as illustrated in Fig. 3.

In order to wind back this unsewn piece of thread, the
hand crank 16 of the device according to the invention
is turned anti-clockwise (Fig. 2). By means of the pri-
mary slip clutch 17, the hollow shaft 14 is turned and
the head plate 15 with the intermediate wheel 29 located
on it is turned as far as the stop 27 allows. In this
position the intermediate wheel 29 comes into driving
connection with the milled edge of the lower thread
bobbin 11. If the hand crank is now turned further in
the same direction it turns the shaft 20 via the secondary
slip clutch 22 and lever 23, and the driving wheel 21
located on same sets the intermediate wheel 29 in motion,
which in its turn rotates the bobbin 11 in the direction
indicated. Thus the length of lower thread not used in
sewing is again wound on to the bobbin 11 so that the un-
desirable loop formation is done away with. Upon re-
leasing the hand crank 16 the spring 24 comes into
action and swings the hollow shaft 14 with the head
plate 15 into the neutral position again.

The slip clutches between the hand crank 16 and the
hollow shaft 14 as well as that between the lever 23 and
the shaft 20 are so proportioned that the transmitting
forces are only sufficient for the pivoting of the device
and for the winding back of the unused length of thread.

The precise constructional form and arrangement of
the device depends on the structure of the particular ma-
chine to which it is to be added. The construction illus-
trated and described is a preferred embodiment.

What I claim is:

1. Manually operable mechanism for a lock-stitch
sewing machine for rewinding a thread onto a rotatable
bobbin unwound therefrom during the inoperativeness
of a needle for the bobbin comprising, a head plate oscil-
latable between operative and inoperative positions, actu-
ating means carried by said head plate for engaging and
rotating the bobbin in the operative position of said head
plate for the rewinding of the thread onto the bobbin,
spring means holding said head plate in inoperative posi-
tion, and means for oscillating said head plate to opera-
tive position and for operating said actuating means.

2. Manually operable mechanism for a lock-stitch sew-

ing machine for rewinding a thread onto a rotatable bob-
bin unwound therefrom during the inoperativeness of a
needle for the bobbin comprising, a head plate oscillatable
between inoperative and operative bobbin rewinding ro-
tating positions, spring means yieldingly holding said head
plate in the inoperative position, bobbin rotating means
carried by said head plate to engage and rotate the bob-
bin, manually operable means arranged to oscillate said
head plate to operative position and thereafter to operate
said bobbin rotating means, and stop means to arrest the
movement of said head plate to its operative position.

3. Manually operable mechanism for a two-needle lock-
stitch sewing machine adapted to rewind onto a bobbin
a thread unwound therefrom during inoperativeness of a
corresponding needle and operation of the other needle
as a work-piece being stitched traverses a corner thereby
to avoid looping of the unwound thread comprising, a
head plate oscillatable between inoperative and operative
bobbin rewinding rotating positions, spring means yield-
ingly holding said head plate in inoperative position, bob-
bin rotating means carried by said head plate to engage
and rotate the bobbin, manually operable means ar-
ranged to oscillate said head plate to operative position
and thereafter to operate said bobbin rotating means, and
stop means to arrest movement of said head plate to its
operative position.

4. Mechanism as set forth in claim 3 wherein said
manually operable means includes, inner and outer co-
axial members, a handle attached to one of said co-axial
members, a primary slip clutch disposed between said han-
dle and said outer co-axial member, a secondary slip
clutch between said handle and said inner co-axial mem-
ber, said slip clutches being arranged whereby said handle
oscillates said head plate to operative position and there-
after said inner co-axial member is rotated to rotate said
bobbin rotating means.

5. Mechanism as set forth in claim 3 wherein, said
manually operable means includes, inner and outer co-
axial members, a handle, a slip clutch between said han-
dle and outer member, a slip clutch between said handle
and inner member, said clutch members being arranged
whereby said handle oscillates said head plate to opera-
tive position and thereafter said inner member is rotated
to rotate said bobbin rotating means.

6. Manually operable mechanism for a lock-stitch sew-
ing machine for rewinding a thread onto a rotatable bob-
bin unwound therefrom during inoperativeness of a needle
for the bobbin comprising, relatively rotatable inner and
outer co-axial members, a head plate fixed on said outer
member, bobbin engaging and rotating means disposed
on said head plate and actuated by said inner member,
said outer member being oscillatable between inoperative
position and operative positions of said head plate where-
in said bobbin rotating means is in engagement with the
bobbin, means limiting movement of said head plate to
operative position, means urging said outer member and
head plate to inoperative positions, a handle, and sepa-
rate clutch means connecting said handle to said inner
and outer members whereby by means of said handle said
outer member and head plate are oscillated to operative
positions and thereafter said inner member is rotated to
actuate said bobbin rotating means.

7. Manually operable mechanism for a lock-stitch sew-
ing machine for rewinding a thread onto a rotatable bob-
bin unwound therefrom during inoperativeness of a needle
for the bobbin comprising, a support, a bracket secured
to said support and having a tubular shaft oscillatable on
a vertical axis therein and having a horizontally disposed
head plate on the upper end thereof, a resilient wheel ro-
tatable on the head plate to engage and rotate a bobbin,
a spindle rotatable in the shaft having a driving wheel
in engagement with said resilient wheel, a handle rotata-
ble on the shaft and a slip clutch between the shaft and
said handle whereby the head plate may be oscillated by
said handle from inoperative to operative position for

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engagement of said resilient wheel with a bobbin, means limiting movement of the head plate to operative position, a member rotatable on said spindle, and a slip clutch between said spindle and rotatable member engageable by said handle as said handle is rotated to position the head plate in operative position whereupon said slip clutch slips to permit continued rotation of said handle to rotate said spindle through a second clutch.

8. Manually operable mechanism for a lock-stitch sewing machine for rewinding a thread onto a rotatable bobbin unwound therefrom during inoperativeness of a needle for said bobbin comprising, a support, a bracket secured to said support and having a tubular shaft oscillatable on a vertical axis therein, the tubular shaft being provided with a horizontally disposed head plate on the upper end thereof, a resilient wheel rotatable on the head plate to engage and rotate a bobbin, a spindle rotatable in the tubular shaft and having a driving wheel in engagement with said resilient wheel, a handle rotatable on the tubular shaft and a slip clutch between the shaft and said handle whereby the head plate may be oscillated by said handle from inoperative to operative position for engagement of said resilient wheel with a bobbin, means limiting movement of the head plate to operative position, a member rotatable on said spindle and a slip clutch between said spindle and member engageable by said handle as said handle is rotated to position the head plate in operative position whereupon said first named clutch slips to permit continued rotation of said handle to rotate said spindle through the second clutch, and means biasing the shaft and head plate to inoperative positions.

9. Manually operable mechanism for a two-needle lock-stitch sewing machine adapted to rewind onto a bobbin a thread unwound therefrom during inoperativeness of a corresponding needle and operation of the other needle as a work-piece being stitched traverses a corner thereby to avoid looping of the unwound thread comprising, a head plate oscillatable between operative and inoperative positions, actuating means carried by said head plate for engaging and rotating the bobbin in operative position of said head plate, spring means holding said head plate in operative position, and means for oscillating said head plate to operative position and for operating said actuating means.

10. Manually operable mechanism for a two-needle lock-stitch sewing machine adapted to rewind onto a bobbin a thread unwound therefrom during inoperativeness of a corresponding needle and operation of the other needle as a work-piece being stitched traverses a corner thereby to avoid looping of the unwound thread, comprising, a head plate fixed on said outer member, bobbin engaging and rotating means on said head plate actuated by said inner member, said outer member being oscillatable between an inoperative position and an operative position of said head plate wherein said bobbin rotating means is in engagement with the bobbin, means limiting movement of said head plate to operative position, means urging said outer member and head plate to inoperative position, a handle, and separate clutch means connecting said handle to said inner and outer members whereby by means of said handle said outer member and head plate are oscillated to operative position and thereafter said inner member is rotated to actuate said bobbin rotating means.

11. Manually operable mechanism for a two-needle lock-stitch sewing machine adapted to rewind onto a bobbin a thread unwound therefrom during inoperativeness of a corresponding needle and operation of the other needle as a work-piece being stitched traverses a corner thereby to avoid looping of the unwound thread comprising, a support, a bracket secured thereto having a tubular shaft oscillatable on a vertical axis therein provided with a horizontally disposed head plate on the upper end thereof, a resilient wheel rotatable on the head plate to engage and rotate a bobbin, a spindle rotatable in the

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tubular shaft having a driving wheel in engagement with said resilient wheel, a handle rotatable on the tubular shaft and a slip clutch between the tubular shaft and handle whereby the head plate may be oscillated by said handle from inoperative to operative position for engagement of said resilient wheel with a bobbin, means limiting movement of the head plate to operative position, a member rotatable on said spindle and a slip clutch between said spindle and member engageable by said handle as said handle is rotated to position the head plate in operative position whereupon said first named clutch slips to permit continued rotation of said handle to rotate said spindle through said second named clutch.

12. Manually operable mechanism for a two-needle lock-stitch sewing machine adapted to rewind onto a bobbin a thread unwound therefrom during inoperativeness of a corresponding needle and operation of the other needle as a work-piece being stitched traverses a corner thereby to avoid looping of the unwound thread comprising in combination, a support, a bracket secured to said support and having a tubular shaft oscillatable on a vertical axis therein horizontally disposed head plate on the upper end of said shaft, a resilient wheel rotatable on said head plate to engage and rotate a bobbin, a spindle rotatable in the tubular shaft and having a driving wheel in engagement with said resilient wheel, a handle rotatable on the tubular shaft and a slip clutch between the tubular shaft and said handle whereby said head plate may be oscillated by said handle from inoperative to operative position for engagement of said resilient wheel with a bobbin, means limiting movement of said head plate to operative position, a member rotatable on said spindle and a slip clutch between said spindle and member engageable by said handle as said handle is rotated to position said head plate in operative position whereupon said first named clutch slips to permit continued rotation of said handle to rotate said spindle through said second named clutch, and means biasing said shaft and head plate to inoperative position.

13. In a two-needle lock-stitch machine with means for holding an inner needle temporarily out of action while the outer needle is operative, the improvement comprising, means operable at the will of the user for re-winding onto a bottom bobbin below the inner needle rendered inoperative, a thread which has been drawn from the bottom by the traverse of the material during the continued operation of the outer needle.

14. In a two-needle lock-stitch machine including means for holding one needle temporarily out of action, the improvement comprising, re-winding means being operable at the will of the user for re-winding onto a bottom bobbin below the inoperative needle a thread drawn from the bobbin by the traverse of the material during the continued operation of the other needle, said re-winding means including a control member and spring means normally holding said control member inoperative wherein a first movement of said control member against the resistance of said spring brings said re-winding means into operative position and a second movement causes said re-winding means to operate.

15. In a two-needle lock-stitch machine having means for holding one needle temporarily out of action, the improvement comprising, re-winding means operable at the will of the user for re-winding onto a bottom bobbin below the needle which has been rendered inoperative a thread which has been drawn from the bobbin by the traverse of the material during the continued operation of the other needle, said re-winding means including a rotary control member and driving and driven members carried by said control member and spring means normally holding said control member inoperative wherein a first rotary movement of said control member brings said driven member into engagement with the bottom bobbin without being driven and a continued rotary move-

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ment of said control member causes said driving member to operate said driven member to rotate the bobbin.

16. In a mechanism for a lock-stitch sewing machine for holding an inner needle temporarily inoperative while the outer needle is operative, the improvement comprising a head plate oscillatable between operative and inoperative bobbin re-winding positions, actuating means carried by said head plate for engaging and rotating the bobbin in the operative position of said head plate for the rewinding of the thread onto the bobbin, yielding 10

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spring means holding said head plate in the inoperative position, and means for oscillating said head plate to operative position and for operating said actuating means.

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1,676,853	Brase	July 10, 1928
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