To all whom it may concern:

Be it known that I, EDWIN J. TOOF, a citizen of the United States, and resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Interchangeable Lock and Chain Stitch Sewing-Machines, of which the following is a specification.

This invention relates to improvements in sewing machines and more particularly to improvements in that class of sewing machines adapted to be used interchangeably for lock and chain stitch sewing. In some machines of this class, such as for example as that shown in Letters Patent No. 687,511, dated Nov. 26, 1901, a change from lock to chain stitch sewing is effected by the removal of the usual shuttle or looper of the under-thread-carrying bobbin and the substitution therefor of a so-called chain-stitch attachment. Such removal and substitution of parts, however, is more or less troublesome, and it has been the main object of my present invention to provide a sewing machine having means whereby it may be readily and conveniently adapted for making either a lock or chain stitch without the removal or substitution of any parts.

To this end the invention, in one form thereof, comprises the combination with a single looper-driver, of a carrier having lock and chain stitch loopers supported thereby and being movable to shift the supported loopers severally to and from an operative position for connection with the looper-driver, and suitable means for effecting connection of the respective loopers with the looper-driver when in operative position relatively to each other, the said parts being so constructed and organized that a mere shifting of the looper carrier a predetermined distance, preferably by an operating means arranged above the bed-plate in a convenient position to be reached by the operator, is all that is necessary to adapt the machine for either form of stitching.

Referring to the accompanying drawings forming part of this specification, in which I have shown only so much of a sewing machine as is necessary to illustrate my invention, Figure 1 is a partial under-side view of a sewing machine embodying my invention. Figure 2 is a central longitudinal section of the same. Figure 3 is a top plan of a part of the bed-plate of the machine containing the slot in which moves the carrier adjusting-screw. Figure 4 is a detail perspective of the connecting ends of the looper-driver and one of the loopers. Figure 5 is a partial under-side view of a machine embodying another form of my invention. Figure 6 is a central longitudinal section of the same. Figures 7 and 8 are detail sectional views through lines 7-7 and 8-8 of Figure 5 respectively. Figure 9 is a partial under-side view of a machine embodying another form of the invention. Figure 10 is an enlarged cross-section through line 10-10 of Figure 9. Figure 11 is a detail to be hereinafter referred to. Figures 12 and 13 are front views of a lock-stitch looper and a chain-stitch looper, respectively.

Similar reference characters designate like parts in the several figures of the drawings.

As my present invention relates only to the looper mechanism of the sewing machine, and as such mechanism will cooperate with the other parts of the stitching-forming mechanism in the formation of stitches in the usual manner, I have deemed it unnecessary in the present case to illustrate and describe other than the said looper mechanism of the machine.

Referring now to the drawings, Figure 1 indicates the bed-plate of a sewing machine, and Figure 2 a shaft journalled in hangers 3, 3, at the under side of said bed-plate. This shaft 2, which constitutes a looper-driver, may be operated at its rear end in any usual or suitable manner, and at its front end is adapted to have operative connection with a looper to actuate the same.

In accordance with my invention, as before referred to, I employ a plurality of loopers, one being preferably a lock-stitch looper such as shown in Figure 12, and the other a chain-stitch looper such as shown in Figure 13, and support the same by a suitable carrier which may be movable in any suitable manner to shift the supported loopers severally to and from an operative position for connection with the said looper-driver to be actuated thereby. The said loopers, indicated at 4, 4, may be of any usual or suitable construction and may also be supported by their carrier in any desired or suitable manner, the same as shown in Figures 1 and 2 being respectively mounted directly on short shafts 5, 5, which are journalled in hangers 6, 6, on the under side of the movable looper-carrier, which latter as shown in said Figures 1 and 2 is in the form of a plate 7 pivoted to the under side of the bed-plate at 8 and being oscillatory to shift the supported loopers to and from an operative position for connection with the looper-driver.

A connection between the respective loopers and the looper-driver when brought into operative position relatively to each other, whereby the loopers will be actuated by said driver, may be effected in any suitable manner, but as a simple and convenient means for effecting such connection I have provided the looper-driver at its front end with a transverse groove 9 and each of the respective looper-shafts 5, 5, with a tongue 10 for entering said groove, the said parts being so arranged that upon the shifting of the looper-carrier the proper distance the tongue of one looper-shaft will be withdrawn from the groove of the looper-driver and the tongue of the second looper-shaft entered therein, whereby the first looper will be moved to an operative position relatively to the looper-driver and the second looper moved to an operative position relatively...
thereto, or, in other words, the first looper will be ren-
dered inoperative and the second looper operative.

As it is obviously desirable that a close union should be
effectual between the looper-driver and the respect-
tive looper-shafts so as to avoid any undue noise or rat-
ting such as might be caused by a loose connection be-

between the parts, I have made the tongues of the looper-
shafts tapering or wedge-shaped and have also made
the groove in the driver of like form to closely receive
the tongues; the said groove, however, being made
with its walls converging toward the center from oppo-
site sides thereof in order to receive and properly coat
with the tongues when arranged to enter the same from
opposite sides as shown in the present case. As a means

to support the looper-carrier at its front or looper-sup-
serting end, I have provided the same with an elon-
gated slot 12 through which a screw 13 extends with one
end threaded into the bed-plate and its opposite or
headed end engaging the under side of the carrier and

supporting the same as shown.

The looper-carrier 7 may be operated in any suitable
or desired manner to shift the supported loopers to and
from an operative position as described. It is desir-
able, however, that the carrier should be capable of be-
ing operated from some point convenient to the oper-
ator and preferably at a point above the bed-plate. To

effect this, I have provided the carrier with an arm 14
extending to a point adjacent to the rear side of the bed-

plate with arm an adjusting-screw 15 at the upper

per side of the bed-plate connects through an elongated
slot 16 in said bed-plate. By this means a movement
of the said adjusting-screw 15 from one end of the slot
16 to the other is the only operation required on the
part of the operator, other than the loosening and tight-

ening of said screw, to change the machine from one
form of stitching to another.

In shifting the respective loopers to and from an op-
erative position in connection with the looper-driver,
it is desirable that such parts should at all times be
maintained in position to effect coupling or connection
when brought into operative position relatively to each
other, whereby no other operation to effect connection
of the parts is required than the mere shifting of the
looper-carrier. As a simple means for maintaining the
parts in such position, and as shown in Figs. 9 to 11 in-
clusive, each of the looper shafts 5, 5, adjacent to their
inner or driver connecting ends are provided with a
flattened surface 18 which, when the looper is shifted
to an inoperative position away from connection with
the driver 2, will engage with the edge of a stationary
rib 19 projecting downwardly from the under side of
the bed-plate and operate to hold the looper-shaft
against rotation and with its tongue 10 in a position to
enter groove 9 of the driver when the looper is again
moved into operative position relatively to the latter,
the said rib being formed with a cut-away portion 20 at
a point in line with the driver so as to permit rotation
of the looper-shafts when in operative connection with
the driver. Such described means operate to hold the

loopers in a non-rotary driver-connecting position when
disconnected from the driver, but as a means to main-
tain the driver with its groove in a position to receive
the tongues of the looper-shafts as they are moved into
connection therewith, I have so arranged the inner ends
of the looper-shafts relatively to the looper-driver that
upon the shifting of the looper-carrier 7 to effect a
change of loopers, the tongue of one looper-shaft will
enter the groove of the looper-driver at one end thereof
prior to the complete withdrawal of the tongue on the
other looper-shaft from the opposite end of said groove,
70 in a manner as clearly shown in Fig. 11. In this way,
turning of the looper-driver such as would prevent the
ready connection or engagement therewith of the looper-
shafts is prevented.

In the construction shown in Figs. 1 and 2, a means
is also provided similar to that shown in Figs. 9 and 11
for holding the loopers in driver-connecting position
when disconnected from the driver, that is, the looper
shafts are each provided with a flattened surface 18
which, when the loopers are shifted to an inoperative
position away from connection with the driver, will
engage with the edge of a stationary rib 19 projecting
downwardly from the under side of the bed-plate and
operate to hold the looper-shaft against rotation and
with its tongue 10 in position to effect connection with
the driver when moved into operative position rela-
tively thereto. In this case, however, the looper-
shafts are arranged farther apart at their rear ends than
in the construction shown in Figs. 9 to 11 so that a com-
plete disconnection of the driver from both looper-
shafts takes place during the shifting of the loopers.
As such disconnection is but momentary, however,
there is but little liability of the looper-driver becom-
ing so turned during the looper-shifting operation as to
prevent the connection therewith of the looper-shafts,
and this can be avoided by the operator holding the

driver stationary by means of the usual hand-wheel
(not shown) during the said looper-shifting operation.

Another difference in the constructions illustrated
in Figs. 1 to 3 inclusive and Figs. 9 to 11 inclusive, re-
spectively, is the location of the carrier-adjusting-
screw. In the construction shown in Figs. 1 to 3 the
pivot 8 of the looper-carrier is located nearer the rear
end of the machine and the said looper-carrier is pro-
vided with an arm 14 extending at substantially right-
angles thereto to a point adjacent to the rear side of
the bed-plate for the connection therewith of the ad-
justing-screw 15, while in the construction shown in
Figs. 9 to 11, in which the pivot 8 of the looper-carrier
is located nearer the front end of the bed-plate, I have
extended the operating arm or end 14' of the carrier
substantially straight thereto from a position to be en-
gaged through a slot 16 in the bed-plate by an adjust-

ing-screw 15' located adjacent to the base of the ma-

chine arm (not shown). As before stated, however,
the particular means employed to shift the looper-car-
rrier or the particular location of such means is imma-
terial to my invention.

Referring now to Figs. 5 to 8 inclusive, I have shown
a form of my invention in which the looper-carrier, in-
stead of being supported to have an oscillatory move-
ment as in the other figures referred to, is supported to
have a reciprocatory movement. In this case, the car-
rrier, indicated at 7', is elastically mounted in suitable
guide-ways 22, 22, in hangers 23, 23, on the under side
of the bed-plate in a manner to be movable transversely
of the bed-plate in shifting the supported loopers and
looper-shafts to and from an operative position for con-
nection with the looper-driver. As a means for operat-
ing the carrier as thus supported, I have mounted a ro
tatable crank-disk 24 in a seat or socket 25 of the bed-
plate and provided with the same with a crank-pin 26 ar-
namated to a axle and operate in a transverse groove 27 in
the carrier 70. With such construction and arrange-
ment of parts, a rotary movement of the crank-disk in
its seat will operate to shift the loop-carrier, and as a
simple and convenient means for operating such crank-
disk for the purpose stated I have provided the same
with a pivoted handle 28 the free end of which may be
raised above the bed-plate for the purpose of operating
the crank-disk and thereafter be dropped or seated in a
groove 29 in the bed-plate. When the handle 28 is
seated in said groove 29 it will be below or flush
with the upper surface of the bed-plate so as not to in-
terfere with the work passing thereover and will also
operate to lock the loop-carrier in its shifted or
adjusted position. In the construction shown in these
Figs. 5 to 8 inclusive, the loopers will also be held
in driver-connecting position when disconnected from
the driver in the same manner as illustrated in the other
figures heretofore described, that is, each
looper-shaft is provided with a flattened surface 18
which will engage with the edge of a stationary rib 19 on
the bed-plate when moved to an inoperative posi-
tion away from connection with the looper-driver, in a
manner as clearly shown in Fig. 7.

Having thus set forth certain embodiments of my in-
vention, it will be understood that the same may be
practically embodied within wide limits without de-
parture from the spirit of the invention, for

What I claim is:

1. In a sewing machine, the combination of a looper-
driver, of a carrier having a plurality of loopers sup-
ported thereby and being movable to shift the supported
loopers to and from an operative position for connection
with said looper-driver, and means for effecting connection
of the respective loopers with the looper-driver when in
operative position relatively to each other.

2. The combination with a looper-
driver, of a carrier having chain and lock-attatch loopers
supported thereby and being movable to shift the support-

ed loopers to and from an operative position for con-
nection with said looper-driver, and means for effecting
connection of the respective loopers with the looper-driver
in operative position relatively to each other.

3. In a sewing machine, the combination of a looper-
driver, and a carrier having a plurality of loopers sup-
ported thereby and being movable to shift the supported
loopers to and from an operative position for connection
with said looper-driver, the said looper-driver and looper
being provided, one with a tapering groove and the other
with a tapering or wedge-shaped tongue to enter said groove, whereby
detachable connection will be effected between the same when
brought into operative position relatively to each other.

5. In a sewing machine, the combination of a looper-
driver, a carrier having a plurality of loopers supported
therby and being movable to shift the supported loopers to and
from an operative position for connection with said looper-
driver, the said looper-driver and looper being provided, with a tapering
or wedge-shaped tongue to enter said groove, whereby
detachable connection will be effected between the same when
brought into operative position relatively to each other.

6. In a sewing machine, the combination of a looper-
driver, a carrier having a plurality of loopers supported
therby and being movable to shift the supported loopers to and
from an operative position for connection with said looper-
driver, means for effecting connection between the
respective loopers and the looper-driver when in operative
position relatively to each other, and means for main-
itaining the loopers in driver-connecting-position when discon-
ected from the driver.

7. In a sewing machine, the combination of a looper-
driver, a carrier having a plurality of loopers supported
therby and being movable to shift the supported loopers to and
from an operative position for connection with said
looper-driver, the said looper-driver and loopers having means for effecting
detachable connection of the same when brought into operative position relatively
to each other, and means for maintaining the said looper-
driver in loops-connection position during the shifting of
the respective loopers to and from a position for connection therewith.

8. In a sewing machine, the combination of a looper-
driver, a carrier having a plurality of loopers supported
therby and being movable to shift the supported loopers to and
from an operative position for connection with said
looper-driver, the said looper-driver and loopers having means for effecting
detachable connection of the same when brought into operative position relatively
to each other, and means for maintaining the said looper-
driver in loops-connection position during the shifting of
the respective loopers to and from a position for connection therewith.

9. In a sewing machine, the combination of a looper-
driver, a carrier having a plurality of loopers supported
therby and being movable to shift the supported loopers to and
from an operative position for connection with said
looper-driver, means for effecting connection of the respective
loopers with the looper-driver when in operative posi-
tion relatively to each other, and means for moving the
carrier to shift the position of its supported loopers.

10. In a sewing machine, the combination with a looper-
driver, of a plurality of loopers being moved to shift the supported loopers to and
from an operative position for connection with said
looper-driver, means for effecting connection of the respective
loopers with the looper-driver when in operative posi-
tion relatively to each other, and means for moving the
carrier to shift the position of its supported loopers.

11. In a sewing machine, the combination with a looper-
driver, of a plurality of loopers being moved to shift the supported loopers to and
from an operative position for connection with said
looper-driver, the said loop-carrier supporting said
loopers and means for effecting detachment when brought into operative position
relatively to each other.

12. In a sewing machine, the combination with a looper-
driver, of a plurality of loopers being moved to shift the supported loopers to and
from an operative position for connection with said
looper-driver, the said loop-carrier supporting said
loopers and means for effecting detachment when brought into operative position
relatively to each other.

13. In a sewing machine, the combination with a looper-
driver, of a plurality of loopers being moved to shift the supported loopers to and
from an operative position for connection with said
looper-driver, the said loop-carrier supporting said
loopers and means for effecting detachment when brought into operative position
relatively to each other.

14. In a sewing machine, the combination with a looper-
driver, of a plurality of loopers being moved to shift the supported loopers to and
from an operative position for connection with said
looper-driver, the said loop-carrier supporting said
loopers and means for effecting detachment when brought into operative position
relatively to each other.
plate and a looper-driver supported in bearings at the
under side thereof, of a pivoted carrier having a plurality
of loopers supported thereby and being moveable to shift
the supported loopers to and from an operative position for
connection with said looper-driver, means for effecting con-
nection of the respective loopers with the looper-driver
when in operative position relatively to each other, and
means located at the upper side of the bed-plate and con-
necting with the carrier through an elongated slot in said
bed-plate to secure the carrier in stationary adjusted posi-
tion.
Signed at New York in the county of New York and
State of New York this 4th day of January A. D. 1903.

EDWIN J. TOOF.

WITNESSES:

CHAR. F. DANE,
E. M. FAITH.