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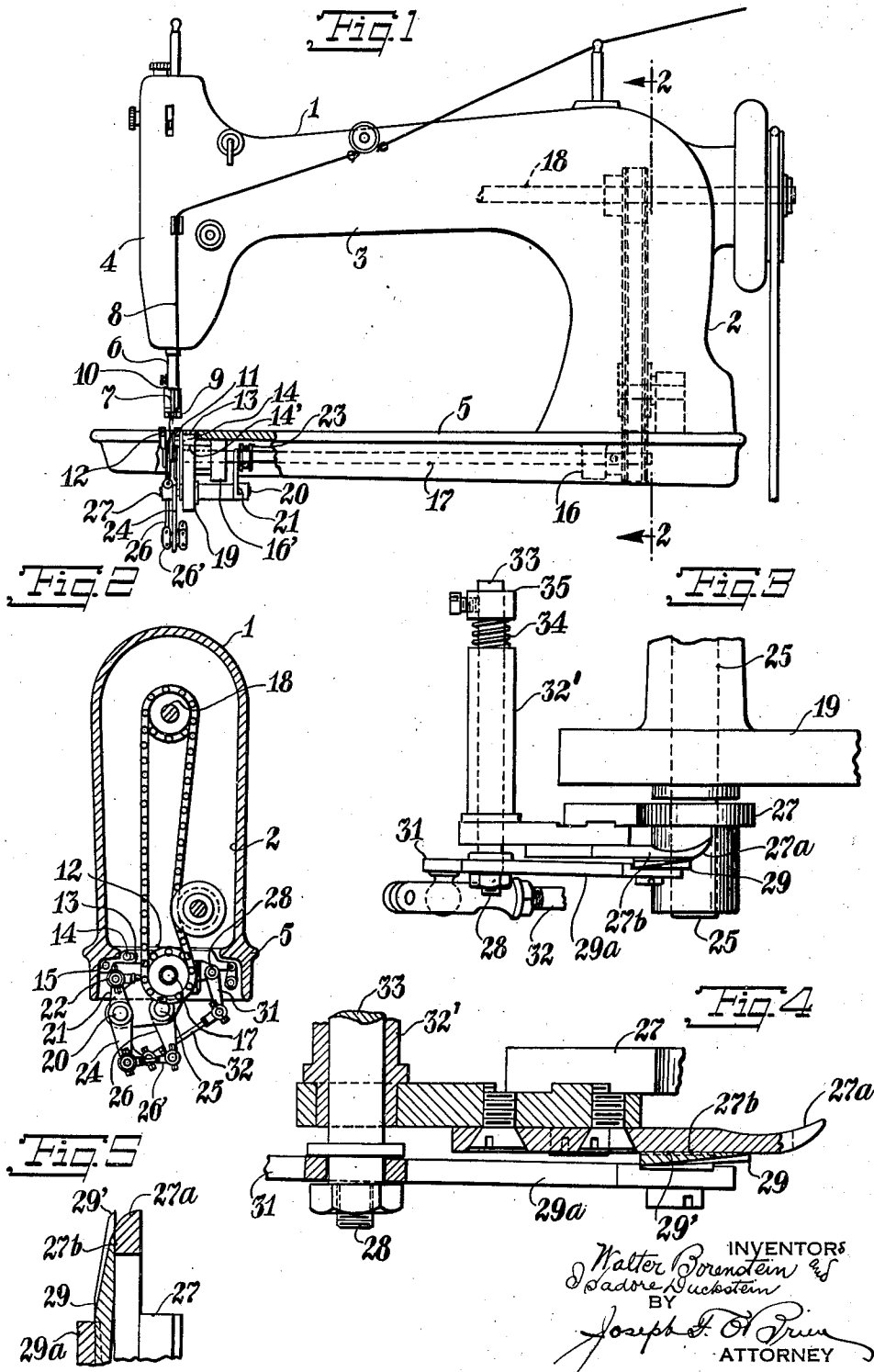
W. BORENSTEIN ET AL

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MACHINE FOR PRODUCING TUFTED FABRICS

Filed Dec. 1, 1937

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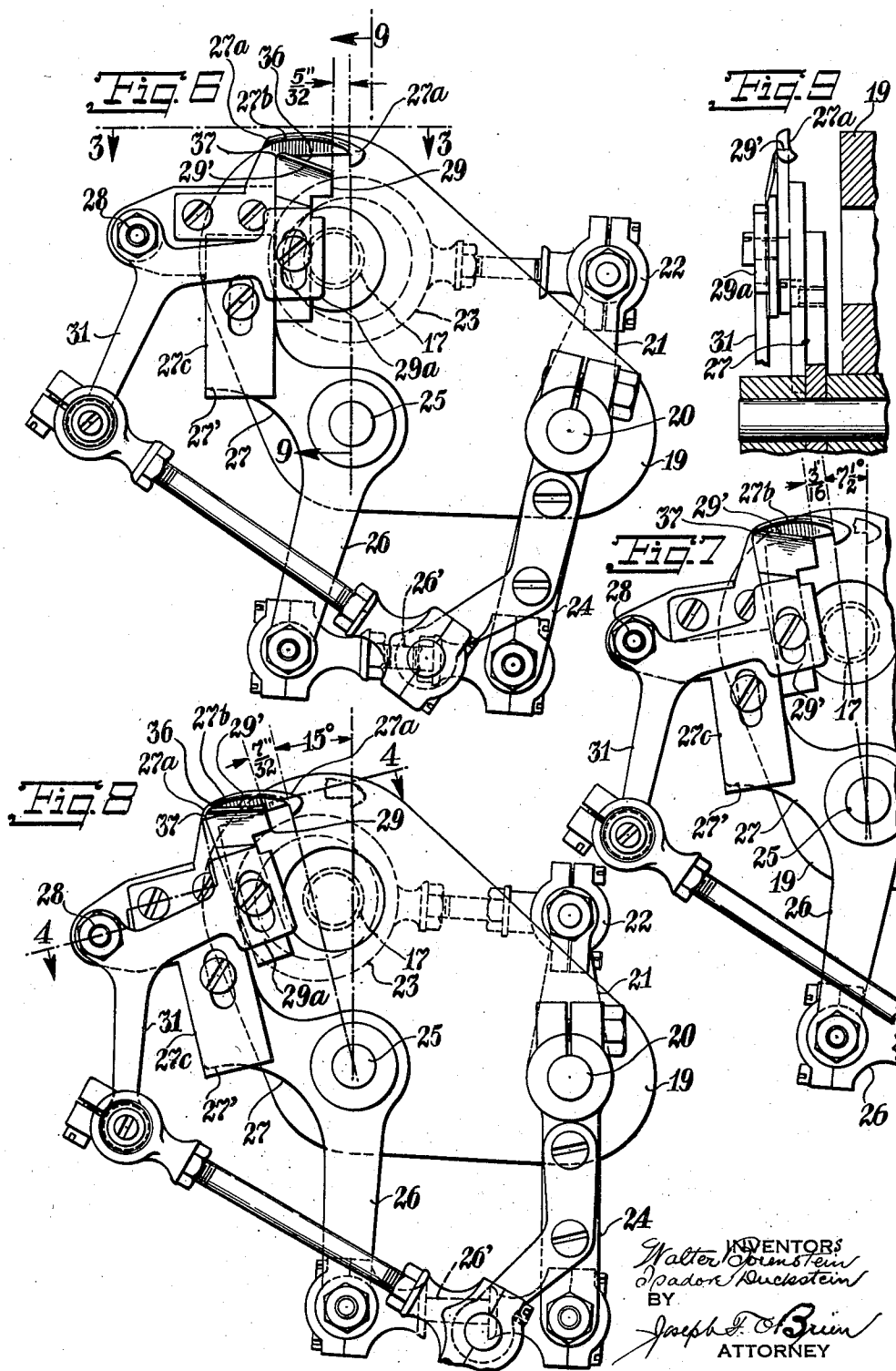
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MACHINE FOR PRODUCING TUFTED FABRICS

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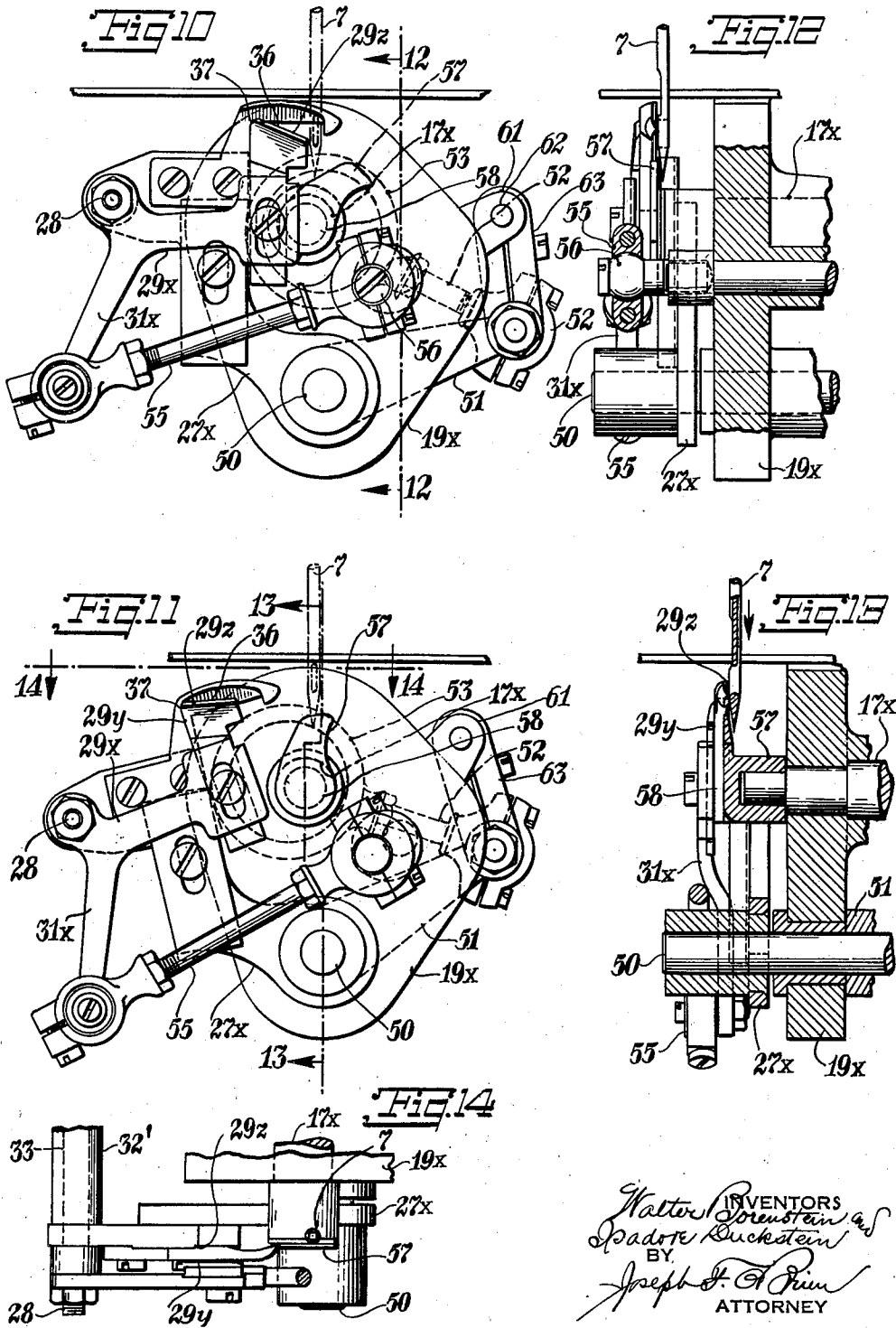
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MACHINE FOR PRODUCING TUFTED FABRICS

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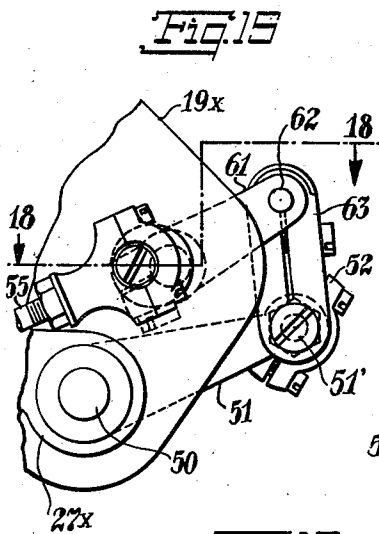
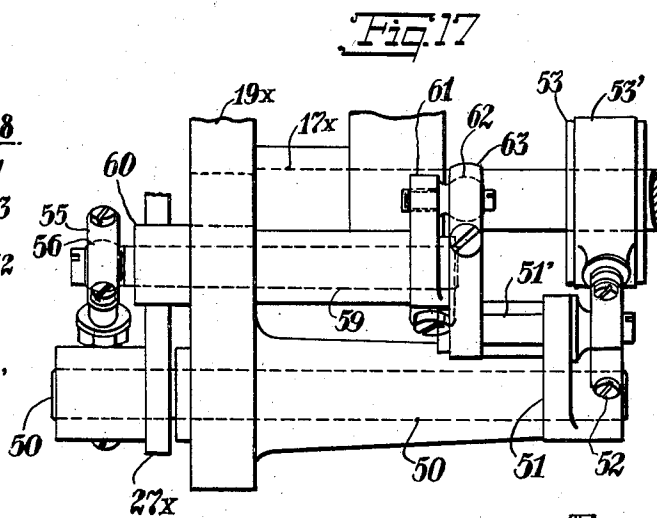
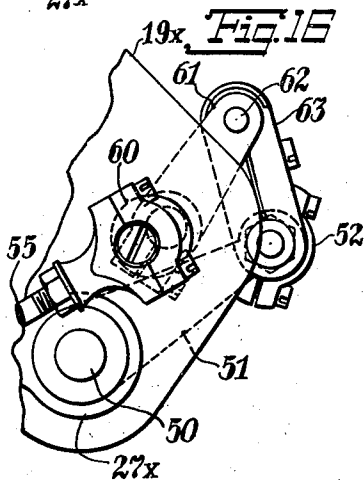
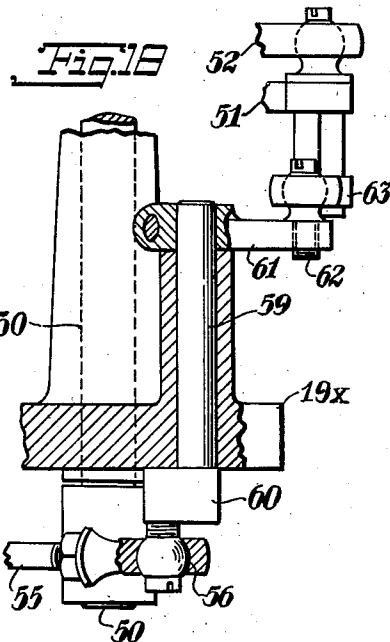
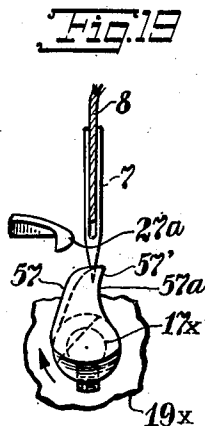
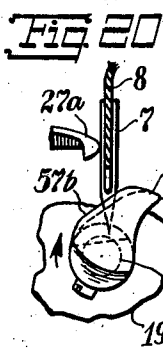
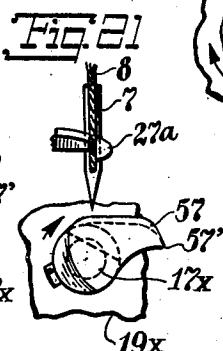
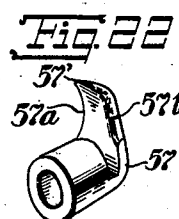
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MACHINE FOR PRODUCING TUFTED FABRICS

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4 Sheets-Sheet 4



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2,242,103

MACHINE FOR PRODUCING TUFTED
FABRICS

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Application December 1, 1937, Serial No. 177,408

4 Claims. (Cl. 112—79)

This invention relates to machines for producing tufted fabrics, such as bed spreads, bath mats and like articles.

Heretofore, in machines of the type specified, blade-carrying arms have been pivoted on a looper member in such manner that the successively contacting points, which form the line of cut between the cooperating cutting edges of the blade and the looper, move or travel outwardly or forwardly and away from the angle between the cutting edges and away from the pivot point, thus producing an outward cutting movement which tends, with yarn of tough material, to roll or force the yarn being cut out of the cutting zone. An impositive cutting action results and at times causes a failure to cut some of the fibres of the looped yarn. Also, in efforts to improve the aforesaid cutting action, reciprocating loopers have been combined with oscillating blade-carriers operated by a spring and various connections with a stationary bar, or a blade-carrier has been slidably mounted on an oscillating looper member, and said blade-carrier has been actuated to slide vertically or reciprocate in a rectilinear line on the looper by a cam and spring. All of these movements are objectionable because of the time lag necessarily accompanying the same and because they produce punching actions on the loops of yarn. The time-lag factor makes it difficult, if not impossible, to run such mechanism at a high rate of speed.

The present invention has as one of its objects, the improvement of the loop-cutting mechanism of a machine of the type specified whereby the difficulties hereinabove specified will be overcome. We accomplish this result by providing an oscillating looper having a projecting bill portion provided with a cutting edge and utilizing an oscillating blade-carrying arm projecting in the same direction as said bill portion and carrying at its free end a blade provided with a cutting edge having an oscillating movement across the cutting edge of the looper, thus avoiding time-lag and loose-connections and permitting high speed to be obtained. Preferably said blade-carrying arm is of such shape and said blade is preferably so relatively positioned in relation to the arc of oscillation of the looper that the two arcs of oscillation will intersect and oscillate the cutting edge of the blade across said cutting edge on the bill portion at an acute angle which will reverse the conventional cutting movement between the cooperating cutting edges of pivoted blade and looper members and cause the contacting points between said cooperating cut-

ting edges to move in an inward or rearward direction toward the angle between the cutting edges, thus tending to roll or move the yarn being cut inwardly or rearwardly toward the cutting angle, resulting in a cutting movement which will more positively cut the yarn.

Another object of our invention is to provide, in a machine of the character specified, an oscillating looper member embodying a shank, a head adjustably mounted on the shank and having a bill portion freely projecting on one side of said shank and movable across the path of travel of the needle to receive loops thereon and provided with a cutting edge, said head being provided with a pivot-supporting extension-portion positioned below and spaced from said cutting edge of the bill and extending to the side of said shank opposite to the bill portion combined with a free-projecting blade-carrying member pivotally connected with said pivot-supporting extension portion of the looper member, and having an arm extending forwardly from said pivot and carrying, at its free end, a blade having a cutting edge oscillating in an arc intersecting the arc of oscillation of the cutting edge of the bill, said projecting arm and blade forming a hammer-shaped oscillating member having a blade at the head thereof which oscillates across the oscillating path of the cutting edge of the looper-bill at a position above the median line of the arc of oscillation of said head thereby causing a slight inward movement toward the pivot of the contacting cutting edges and resulting in an improved cutting action over the conventional scissors action.

Another object of our invention is to position the pivot of the oscillatory cutter arm outside of an extended arc coinciding with the arc of oscillation of the looper-bill thus providing a relatively long oscillating arm for the blade and a better cutting of yarn thereby.

Another object of our invention is, in a device of the character specified, to provide flat contact surfaces between the blade and bill portion and to utilize, at the aforesaid pivotal connection between the looper and blade members, means for yieldingly maintaining the blade and looper-bill in engagement with each other during the entire oscillating movement of the movable blade.

Another object of our invention is, in a device of the character specified, to provide a vertically-inclined cutting edge on the blade having an upwardly-extending toe portion which oscillates in an arc across the cutting edge of the bill and is held in constant engagement with the wall of

the bill at and adjacent to the knife-edge portion thereof.

Still another object of our invention is to utilize, in combination with the above-mentioned cooperating oscillatory cutting members, rocking mechanism so arranged that with a single rocking movement in one direction the looper will be extended to receive the loop and the cutting blade will be moved away from the cutting edge of the looper so that a space will be opened therebetween while by a single movement in the opposite direction the looper will be retracted and the blade oscillated across the cutting-edge of the looper to cut a loop, whereby both the blade and looper will be simultaneously moved in opposite direction by a single rocking movement of a rock-shaft.

With these and other objects in view the invention comprises the combination of members and arrangement of parts so combined as to co-act and co-operate with each other in the performance of the functions and the accomplishment of the results herein contemplated, and comprises in one of its adaptations the species or preferred form illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevation, partly broken away, of a sewing machine having our present invention applied thereto;

Fig. 2 is a section on the line 2—2 of Fig. 1, looking in the direction of the arrows and showing a high-speed power-transmission gearing between upper and lower rotary power shafts;

Fig. 3 is a top plan view of the looping and loop-severing mechanism;

Fig. 4 is an enlarged fragmentary transverse section beneath the base adjacent to the needle opening on the line 4—4 of Fig. 8, looking in the direction of the arrows;

Fig. 5 is an enlarged vertical section through the cooperating cutting edges of the blade and looper members;

Fig. 6 is a view in front elevation of the cooperating oscillating looper and blade members and operating mechanism in extended position;

Fig. 7 is a fragmentary view similar to Fig. 6 showing the same parts in partly retracted position;

Fig. 8 is a view similar to Fig. 6 showing the same parts in fully retracted position;

Fig. 9 is a section on the line 9—9 of Fig. 6, looking in the direction of the arrows;

Fig. 10 is an elevation similar to Fig. 6 showing a modified form of operating mechanism for our oscillating looper and knife members, the parts being in extended position;

Fig. 11 is another similar side elevation with the parts in retracted position;

Fig. 12 is a vertical section on the line 12—12 of Fig. 10, looking in the direction of the arrows;

Fig. 13 is a vertical section on the line 13—13 of Fig. 11, looking in the direction of the arrows;

Fig. 14 is a fragmentary plan view looking from the line 14—14 of Fig. 11, looking in the direction of the arrows;

Figs. 15 and 16 are fragmentary front elevations showing, in dotted lines, different positions of the eccentric movement of the pivot member for blade member illustrated in Figs. 10 to 14;

Fig. 17 is a side elevation of the modified mechanism shown in Figs. 10 to 16, the same being shown in extended position;

Fig. 18 is a view in plan partly in section on the line 18—18 of Fig. 15, looking in the direction of the arrows;

Figs. 19, 20 and 21 are views showing our revolving needle-guide member in several positions; and

Fig. 22 is a perspective view of said needle guide member.

Referring now to Figs. 1 to 9 of these drawings which illustrate a specific embodiment of our invention, the numeral 1 indicates a sewing machine, as a whole, any well known or preferred type, such as the ordinary Singer sewing machine. The sewing machine comprises an upright stock 2, an overhanging arm 3 and a head 4. The machine has a flat base 5, and the head 4 is provided with the usual vertically-reciprocating needle bar 6, carrying a needle 7, provided with the usual eye for receiving a tufting thread 8. This tufting thread is fed from any suitable source, not shown, and any suitable tension means may be provided for tensioning the tufting thread. The sewing machine embodies the usual means for reciprocating the needle and the usual presser foot 9, carried by a reciprocating presser bar 10. The sewing machine further embodies work-feeding means to advance the work from the operator, including dogs operating through a suitable opening in the base 5, and these dogs are mounted on a dog-supporting link or bars 11 and 12 and suitably actuated through cranks not shown, and link 12 having a fork 13 for receiving the roller 14 pivotally mounted at 14' on a crank arm 15, in turn mounted upon a rock shaft, not shown. The foregoing description is that of the conventional sewing machine.

In accordance with our present invention, we mount in suitable bearings 16, 16' beneath the machine, a power shaft 17 and utilize a conventional high-speed gearing for transmitting power from the drive shaft 18 for the needle-reciprocating mechanism and this power shaft preferably terminates a plane just at the rear of the work-operating mechanism and has an end part projecting beyond its bearings, and in one form of our invention, we mount on a hub surrounding the projecting portion of the power shaft 17, a bracket 19 in which is mounted our loop-cutting mechanism.

In accordance with the form of our present invention shown, in Figs. 1 to 9, the bracket has mounted therein a stub shaft 20 projecting rearwardly from the said bracket and having at its rear end a rocking arm 21 connected by a link 22 with an eccentric 23, mounted on the power shaft 17. Obviously, rotation of the power shaft 17 with the eccentric mounted thereon will move the link 22 and rock the arm 21 to cause a rocking of the said stub shaft 20. The said stub shaft 20 projects through the supporting bracket 19 and carries at its other end, a rocking arm 24 for operating the looper and blade mechanism.

In accordance with the form of our invention shown in Figs. 1 to 9, the looper 27 is pivoted on pivot 25 in the said supporting bracket to oscillate the outer end thereof across the path of reciprocating travel of the needle and, as illustrated in said figures, has an operating arm 26 extending below the same. The end of this operating arm 26 is adjustably connected by a link 26' to the rocker arm 24. The oscillating looper 27 comprises an oscillating arm 27' carrying at its outer free end a carrier plate 27^c having a

forwardly projecting bill 27^a and a cutting edge 27^b, said plate 27^c being removably mounted on the oscillating arm 27' so as to permit renewal of the bill and cutting edge, the latter of which constitutes one of the cooperating cutting edges for cutting loops of yarn received on the bill of the looper. The bill is obviously carried by the looper in an arc of oscillation across the reciprocating path of the needle and the cutting edge 27^b which is preferably rectilinear follows the same arcuate path at the rear of the nose 27^a of the said bill.

In accordance with our invention, the other cooperating cutting edge 29' for severing the loops is formed on a demountable blade 29 which is mounted at the free end of an oscillating blade-carrying arm 29^a to provide a hammer-shaped blade-oscillating member which is so pivoted as to cause the cutting edge of the oscillating blade at the end thereof to intersect the path of oscillation of the cutting edge on the bill portion of the looper. As illustrated, the said cutting edge of the blade oscillates across the oscillating path of the cutting edge of the looper-bill at a position above the median line of the arc of oscillation of said head thereby causing a slight inward movement toward the pivot of the contacting cutting edges and resulting in an improved cutting action over the conventional scissors action. As illustrated, we position the pivot of the oscillatory cutter arm outside of an extended arc coinciding with the arc of oscillation of the looper-bill thus providing a relatively long oscillating arm for the blade, a better cutting angle and a better cutting of yarn thereby. Also, we provide flat contact surfaces between the blade and bill portion and utilize, at the aforesaid pivotal connection between the looper and blade members, means for yieldingly maintaining the blade and looper-bill in engagement with each other during the entire oscillating movement of the movable blade. Furthermore, we provide a vertically-inclined cutting edge on the blade having an upwardly-extending toe portion which oscillates in an arc across the cutting edge of the bill and is held in constant engagement with the wall of the bill at and adjacent to the knife-edge portion thereof.

In accordance with the preferred forms of our invention, we utilize, in combination with the above-mentioned cooperating oscillatory cutting members, rocking mechanism so arranged that with a single rocking movement in one direction the looper will be extended to receive the loop and the cutting blade will be moved away from the cutting-edge of the looper so that a space will be opened therebetween while by a single movement in the opposite direction the looper will be retracted and the blade oscillated across the cutting-edge of the looper to cut a loop, whereby both the blade and looper will be simultaneously moved in opposite directions by a single rocking movement of a rock-shaft, and in the embodiment shown in Figs. 1 to 9, the said blade-oscillating member has an operating arm 31 preferably extending to the outer side of the pivot 28, and into the said preferred form of our invention this arm is so synchronously rocked as to cause the blade-cutting edge 29' to be oscillated, as aforesaid, into cutting relationship to the cutting-edge on the bill, and in the said preferred form of our invention such synchronous movement of the blade-oscillating and looper-oscillating members is accomplished by operating both the looper and knife members

from a common rocker arm so that by a single movement of this rocker arm, the looper will be extended and retracted and the blade-oscillating member which is carried thereby will be alternately opened to admit threads between the cutting edges and closed to cut the loops received on the bill and moved by the feed mechanism into contact with the cutting edge on the bill of the looper. This movement will be accomplished simultaneously, preferably by a single element so that both oscillating movements of the looper and blade members will be both positive and absolutely synchronous.

It will be seen that in this arrangement by movement in one direction of a rocker arm 24 we simultaneously move the operating members of the looper and knife in one direction to extend the looper and, at the same time, move the knife edges of the blade and looper members out of contact and away from each other while movement in the opposite direction of the rocker arm 24 will cause a retraction of the looper and a simultaneous oscillation of the blade and its cutting edge across the cutting edge of looper into loop-severing engagement as hereinabove more particularly specified.

In accordance with the present improvement, the cooperating contacting faces adjacent to the cutting edges of the blade and looper members are flat except for a slight twist adjacent to the cutting edge of the blade and these flat portions are held in resilient engagement by the extending of the pivot 28 rearwardly to provide an extension 33, mounting on said extension 33 a sleeve 32 and providing a spring 34 arranged between the end of the sleeve 32 and a washer 35 fixed to the extension pin 33.

Also in accordance with our invention, the blade is, as above indicated, provided with a vertically-inclined cutting edge 36 having a toe portion 37 which is at all times maintained in yielding engagement with the face of the looper bill adjacent to the cutting edge and forms a guide for the movement of the cutting edges into cutting relationship.

In Figs. 10 to 19 we have shown a simplified form of our invention having similarly oscillating looper and blade members. In this form, however, a looper arm 27^x carrying a detachable bill having a cutting edge is mounted for oscillation directly upon a rock-shaft 50 which is connected through arms 51 and 52 to an eccentric 53 on a rotating power shaft 17^x and is rocked thereby. The looper arm 27^x is thus oscillated to cause the projected bill to move in an arc and in extended position to cross the path of the needle so as to receive loops therefrom and also to move sidewise into retracted position out of the path of the needle carrying loops thereon, the movement being in all respects similar to the movement of the looper 27 hereinabove described.

The oscillating looper also has mounted thereon, an oscillating blade-arm 29^x carrying a blade 29^y having a cutting edge 29^z all similarly arranged, shaped and disposed in relation to each other and to the looper bill and cutting edge thereof, as hereinabove described in respect to Figs. 1 to 9. In this simplified and preferred form of mechanism, however, the blade-carrying arm is caused to oscillate by pivotally connecting to the end of an operating arm 31^x one end of a reentrant link-arm 55 of suitable length and then pivotally connecting the opposite end of said link to a short elliptical oscillating or

rocking block 60 fixed eccentrically on an auxiliary rock-shaft 59 mounted in and extending to the rear of the bracket 19*. Rocking or oscillating movement is transmitted to the auxiliary rock-shaft 59 through arms 61 pivotally connected by ball-pivot 62 to arm 63 which is pivotally connected through elongated pivot 51' to rock-arm 51 which transmits rocking motion to the rock-shaft 50 and which is itself rocked through a ball-pivotal connection with one end of arm 52, the opposite end 53' of which is connected with an eccentric 53 on the rotating power-shaft 17*. The shaft 59 and block 60 are positioned on the supporting bracket 19* at a point above the pivot 50 so as to cause the link to extend in a direction which will permit connection to a rocking member of reduced length positioned between extended radial lines forming extreme limits of oscillating movements of the end of the blade arm and which intersects the bounding radii of the oscillating arc of the looper 27*. Thus the mechanism will be compact and the link 55 will transmit positive rocking movement to the operating arm 31* of the oscillatory blade arm which carries the blade 29*, the cutting-edge of which will thus oscillate across the cutting-edge of the bill of the looper in a manner similar to that hereinabove described as to the construction shown in Figs. 1 to 9 inclusive.

We have found that the construction of loop-cutting mechanism shown in Figs. 10 to 18 inclusive, is not only more compact than the construction shown in Figs. 1 to 9, but that it is much more free from vibration than said previously described construction resulting in a smooth-running machine. Both constructions, however, eliminate the time-lag necessarily accompanying the use of springs, cams and the like enabling the mechanism to be run at a high rate of speed,—approximately 2500 R. P. M.,—without difficulty. Also, we provide in both constructions positive movement of both blade and looper members and enable more positive cutting of the yarn.

In devices of the character under consideration, when used with an unguided needle, the bill or hook of the looper at times in its oscillating movement collides with the needle, causing breaking of the said bill or needle or both, and resulting in delay pending replacement. It is, therefore, desirable to guide the reciprocating movement of the point of the needle in order to provide proper registration between said point of the needle and the point of the bill member, and in the embodiment of our invention shown in Figs. 19 to 22, we have illustrated a revolving or rotating guide 57 for the point of the needle. The bill moves across the path of the needle just as it reaches its lowermost position, and as illustrated, this rotating guide is mounted directly on the end of the power shaft and is so positioned and its movement is so synchronized that on each rotation it will contact with the point of the needle and preferably maintain such contact throughout a considerable portion of the needle movement, viz., while it is approaching and reaching its lowermost position and during the approach to and passage of the bill or hook across the path of the needle to enter the space between the needle and the yarn carried in the eye thereof. By our invention, this guiding is accomplished without fouling of the yarn section which is carried by the eye of the needle and which is about to be looped, free

movement thereof being permitted. With these ends in view, the upper edge of the inner wall of the guide member is preferably beveled or tapered in a direction complementary to that of the tapering point of the needle, so that during rotation of the guide member, the point of the needle, when not moving in a true path, will be engaged by this tapered edge and such engagement will shift the needle into registration or proper positioning, as aforesaid.

It is desirable that contact with the needle be maintained for a portion of the movement greater than the distance between the tip of the needle and the eye and in order to accomplish such contact with the needle without fouling the yarn carried in the eye thereof, the guide member has a top edge portion 57' adjacent to the leading edge 57^a which extends outwardly radially a distance greater than the distance between the tip and eye of the needle so as to engage the needle at a relatively high position. This engagement can only be momentary and in order to maintain contact with the needle during its further downward travel without fouling the yarn, the top edge 57' of the guide member 57 is rapidly reduced in radial length and merges with the trailing edge 57^b of said member in a downward abrupt curve or taper toward the hub, thus in revolving causing a radial shortening of the guide member as the needle moves downwardly while maintaining contact between the needle tip and the edge of the guide well below the eye of the needle at all positions of the guide, viz. from the position of first engagement or contact before the path of the bill crosses the needle's eye to the end of the downward movement of the needle. Obviously, when a needle is so guided, the bill portion of the looper will be accurately inserted between the needle and yarn and into the loop produced adjacent to the eye of the needle and, thereafter, the guide member will, in its further rotating movement, move away from the needle until the next rotation of the guide meets the needle tip on the next reciprocation thereof, it being understood, of course, that the movement of the guide and needle will be properly synchronized.

When needles are guided properly, as aforesaid, it is possible to produce all kinds of designs and particularly to intersect one or more rows of stitching and tufting with other rows to accomplish this character of work without reduction in speed of operation.

It is desirable in both constructions hereinabove described that the blade members 29 and 29* have a slight yieldable tilting movement as well as a yieldable bodily outward movement along the pivot 23, and with this end in view we preferably provide a slight clearance (not shown) between the inner periphery of the extension portion 33 of the pivot 23 and the inner cylindrical surface of the sleeve 32. This slight clearance between the pivot and its sleeve permits a tilting of the blade sufficient to avoid the possibility of bending or distorting the blade arm when, during cutting operation, a section of yarn is encountered that, because of oil impregnation or for other reasons, is too tough to be cut by a normal cutting operation. The avoidance of bending of the blade-carrying arm under such conditions saves the time which would otherwise be necessarily employed in straightening said blade arm.

Having described our invention, we claim:

1. In a machine for producing a tufted article,

stitching mechanism including work-feeding means and a reciprocatory needle for carrying the tufted thread through the fabric and producing loops, an oscillating looper member having a projecting bill-portion provided with a cutting-edge having extension and retraction movements in an arc of oscillation across the path of the needle, an oscillating blade-carrying arm pivoted on the looper member and projecting in the same direction as the said bill-portion and carrying, at its free end, a blade movable in an oscillating arc intersecting the arc of oscillation of said bill-portion and provided with a cutting-edge movable across the cutting-edge of said bill-portion, a rock-shaft, means for rocking said shaft in synchronism with the movements of the needle, motion-transmitting connections between said rock-shaft and said looper and blade members to transmit motion to said bill-portion and blade member to oscillate the same into cutting relationship, a needle guide element comprising a rotatable plate provided with a leading edge disposed to one side of the median line of the plate and downwardly-inclined top and trailing edges extending from said leading edge across said median line and forming, adjacent to the leading edge thereof, a toe adapted to initially contact the needle tip above the end of its down stroke, and means for rotating said guide element in a path contiguous to the path of reciprocation of the point of the needle.

2. In a machine for producing a tufted article, stitching mechanism including work-feeding means and a reciprocatory needle for carrying the tufted thread through the fabric and producing loops, an oscillating looper member having a projecting bill-portion provided with a cutting-edge having extension and retraction movements in an arc of oscillation across the path of the needle, an oscillating blade-carrying arm pivoted on the looper member and projecting in the same direction as the said bill-portion and carrying, at its free end, a blade movable in an oscillating arc intersecting the arc of oscillation of said bill-portion and provided with a cutting-edge movable across the cutting-edge of said bill-portion, a rock-shaft, means for rocking said shaft in synchronism with the movements of the needle, motion-transmitting connections between said rock-shaft and said looper and blade members to transmit motion to said bill-portion and blade member to oscillate the same into cutting relationship, a needle guide element comprising a rotatable plate provided with a leading edge disposed to one side of the median line of the plate and downwardly-inclined top and trailing edges extending from said leading edge across said median line and forming, adjacent to the leading edge thereof, a toe adapted to initially contact the needle tip above the end of its down stroke, and means for rotating said guide element in a path contiguous to the path of reciprocation of the point of the needle, said toe, top and trailing edge being provided at the inner surface with a beveled edge adapted to contact with and guide the point of the needle.

3. In a machine for producing a tufted article, stitching mechanism including work-feeding means and a reciprocatory needle for carrying tufted thread through the fabric and producing loops, an oscillating looper member mounted be-

neath said needle to swing in an arc of oscillation and having a projecting bill portion movable in clockwise and counter-clockwise movements traversing the path of the needle, said projecting bill portion having a cutting edge positioned at the end of its clockwise movement in a line substantially perpendicular to said path of the needle, an elongated oscillating blade-carrying arm mounted on a pivot carried by the looper member and projecting in the same direction as the said bill portion, a blade-member carried at the end of said blade-carrying arm and extending at substantially a right angle to the axis of said arm to cause said arm and blade member to assume a hammer-shaped configuration and to produce a chopping movement in relation to the cutting edge of the looper member, said blade having a cutting edge extending in a line inclined at an acute angle to said cutting edge of the looper bill-portion and rubbing against the same during said counter-clockwise movement, said blade-pivot being positioned on said looper member at a point remote from the inner end of the cutting edge and outside of any prolongation of the lines of said cutting edges, and means for simultaneously oscillating said looper member and blade to cause said blade cutting-edge to travel inwardly in relation to the cutting-edge of said looper bill-portion during said counter-clockwise rubbing movement.

4. In a machine for producing a tufted article, stitching mechanism including work-feeding means and a reciprocatory needle for carrying tufted thread through the fabric and producing loops, an oscillating looper member mounted beneath said needle to swing in an arc of oscillation and having a projecting bill portion movable in clockwise and counter-clockwise movements traversing the path of the needle, said projecting bill portion having a cutting edge positioned at the end of its clockwise movement in a line substantially perpendicular to said path of the needle, an elongated oscillating blade-carrying arm mounted on a pivot carried by the looper member and projecting in the same direction as the said bill portion, a blade-member carried at the end of said blade-carrying arm and extending at substantially a right angle to the axis of said arm to cause said arm and blade member to assume a hammer-shaped configuration and to produce a chopping movement in relation to the cutting edge of the looper member, said blade having a cutting edge extending in a line inclined at an acute angle to said cutting edge of the looper bill-portion and rubbing against the same during said counter-clockwise movement, said blade-pivot being positioned on said looper member at a point remote from the inner end of the cutting edge and outside of any prolongation of the lines of said cutting edges, means for simultaneously oscillating said looper member and blade to cause said blade cutting-edge to travel inwardly in relation to the cutting-edge of said looper bill-portion during said counter-clockwise rubbing movement, and means for positively moving said blade about its said pivot independently of the movement of the looper and during said simultaneous counter-clockwise movements thereof.

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