Sept. 20, 1932. F. DELPLANQUE 1,877,824

MACHINE FOR SEWING VELVET ON TO FABRICS OF ANY KIND

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Fig. 1

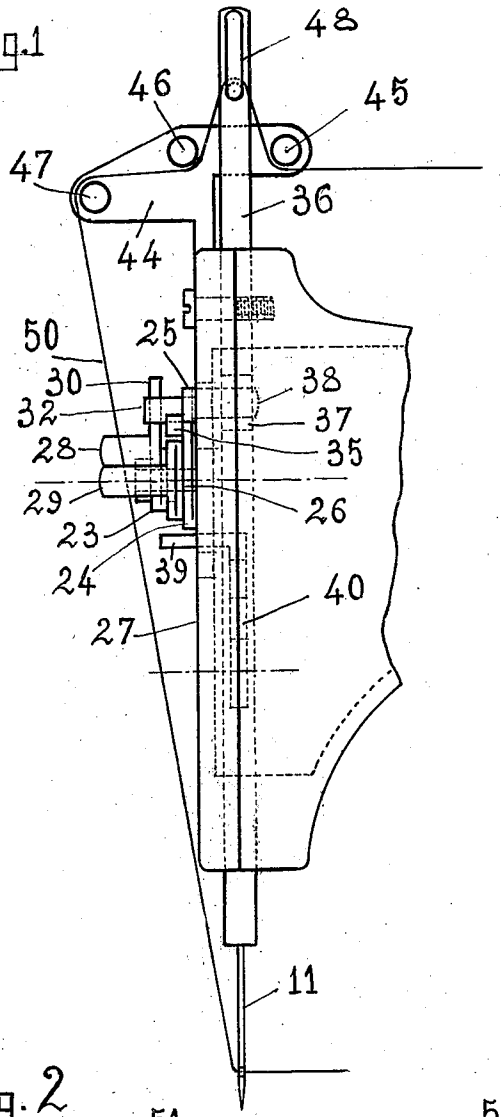
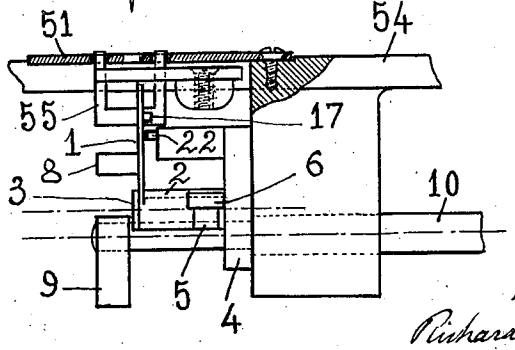


Fig. 2



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Fig. 3

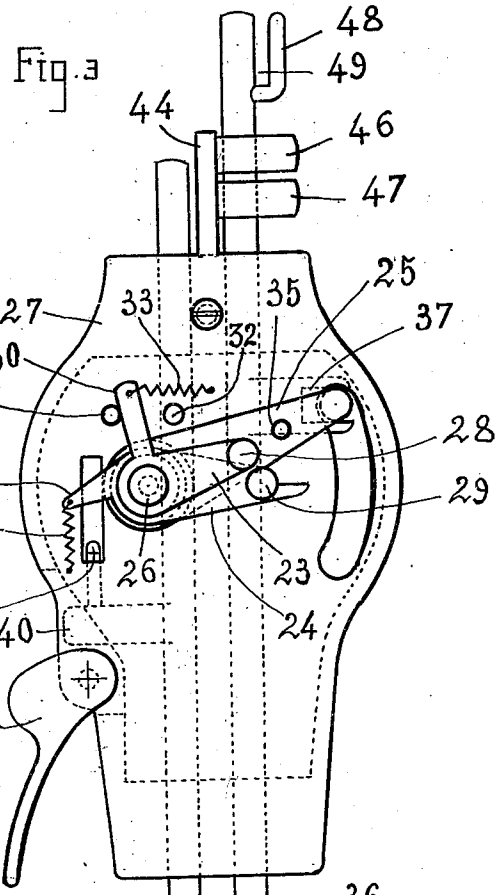
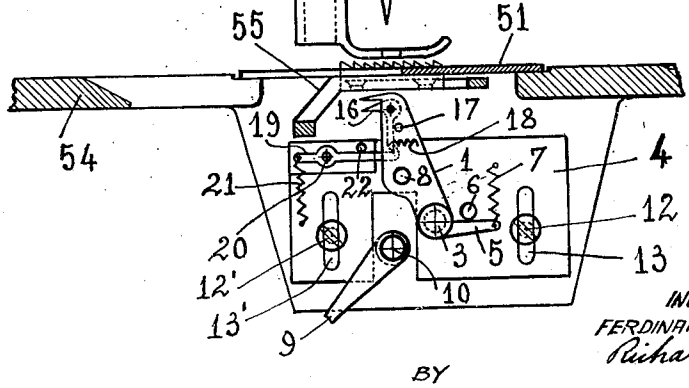


Fig. 4



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Fig. 5

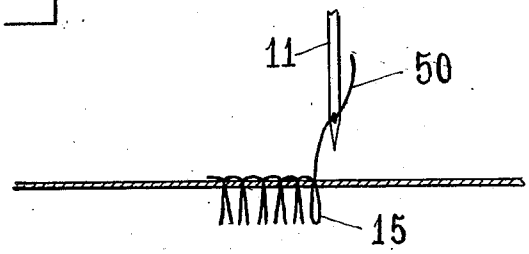


Fig. 6

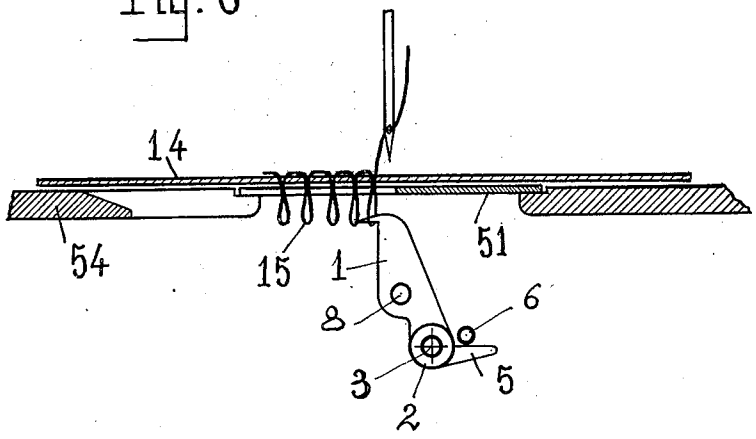
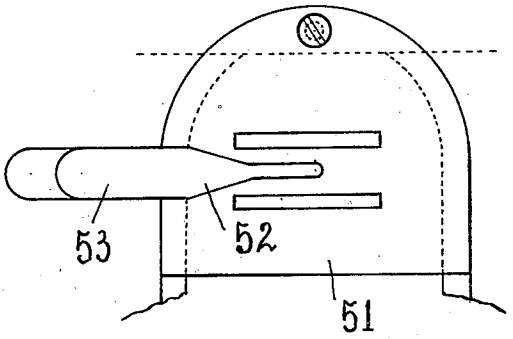


Fig. 7



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UNITED STATES PATENT OFFICE

FERDINAND DELPLANQUE, OF PARIS, FRANCE

MACHINE FOR SEWING VELVET ON TO FABRICS OF ANY KIND

Application filed April 23, 1928, Serial No. 272,160, and in France March 24, 1928.

The present invention relates to a machine by means of which velvet can be formed upon fabrics of any kind by sewing the pile thread stitch by stitch.

The object of the invention is to produce by mechanical means and with the greatest ease and rapidity velvet designs of the greatest variety as regards appearance and relief upon all fabrics intended for use both for furnishing and clothing, the results obtained forming a special type of embroidery for the production of which a sewing machine modified for the purpose is employed.

The machine employed is therefore to some extent analogous to an ordinary sewing machine of any type since it is necessary to actuate the needle, the toothed claw securing the advance of the fabric, the lever or shaft controlling the shuttle and it is also necessary to press the fabric upon the machine and be able to regulate the stitch.

In addition to these motions which remain the same it is necessary, since it is in this case no longer a question of sewing but simply of forming loops which after they have been cut will form the velvet which it is desired to produce, to employ and cause to operate under clearly defined conditions a hooked lever which will be called a looping hook, which hook will be provided if desired with a device for cutting the loops as they are formed.

Further in order that the looping hook will secure the formation of the loops with the desired uniformity it is necessary to hold and tension the thread and draw the necessary amount of thread for a stitch automatically from the bobbin so that the needle will encounter no resistance on the part of the thread, the effect of which would be to make the loop engaged upon the looping hook slide and would shorten the preceding one.

Finally the needle plate must be different from that employed in the usual sewing machines and also the toothed feed dog for advancing the fabric in order to permit the loops to pass out easily whatever their length.

Figs. 1 to 7 in the accompanying drawings refer to an arrangement of a machine designed wih the object of attaining the desired object.

Fig. 1 is a side view showing the manner of holding and tensioning the thread and drawing it from the bobbin.

Fig. 2 is a side view showing the mechanism controlling the looping hook.

Fig. 3 is a front view corresponding to Fig. 1.

Fig. 4 is a front view corresponding to Fig. 2.

Fig. 5 illustrates the formation of the loops which are cut as they are formed.

Fig. 6 shows an adjustable looping hook retaining the loops so that they will be formed with constant uniformity.

Fig. 7 is a plan view of the needle plate adapted to permit the passage out of the loops sewn upon the fabric without there being any danger of them becoming ravelled.

In the following description it will be noted that the looping hook is actuated by a shaft having a semirotary to and fro motion like the one which actuates the shuttle in sewing machines of the oscillating shuttle type. The looping hook may also be controlled, with a modification of detail, by a shaft having a continuous rotary motion or by a lever, as employed in other types of sewing machines.

The various parts of the arrangement shown in the drawings will now be described.

1. Looping hook and associated mechanism (Figs. 2 and 4).

The looping hook 1 rigid with the sleeve 2 oscillates about its pivot 3 secured to the support 4. The sleeve 2 comprises a lug 5 at its tail end which limits the position of the looping hook 1 by means of the stop 6 provided upon the same support 4. The lug 5 is drawn against the stop 6 by the coil spring 7. The looping hook 1 comprises an abutment piece 8 against which strikes the tappet 9 mounted upon the oscillating shaft 10.

During its movement the oscillating shaft 10 carries along with it the tappet 9 which, acting upon the stop 8, moves the looping hook 1 away from the needle 11 and disengages the hook from the loops formed in or-

der to allow it to return into the loop which is being formed.

Two slots 13 and 13′ are formed in the support 4 which is secured in place by screws 12 and 12′ passing through these slots thus permitting the distance between the looping hook 1 and the fabric 14 to be varied, which distance decides the length of the loops 15.

2. Loop cutting device (Fig. 4).

Upon the looping hook 1 is pivoted a lever 16 the beak of which is formed with a cutting edge as also is that of the looping hook 1.

The tail of the lever 16 which is returned against the stop 17, rigid with the looping hook 1, by the coil spring 18 is held at its end by the catch 19 pivoted about the spindle 20 secured upon the support 4 and pulled by the coil spring 21 against the stop 22 rigid with the support 4.

When the tappet 9 acting upon the stop 8 pushes the looping hook 1 back, the beak of the lever 16, the tail of which is held by the catch 19, approaches the beak of the looping hook 1 acting as thread cutting scissors. At the same moment the tail of the lever 16 escapes from the catch 19 and is pulled by the spring 18 against the stop 17. When the looping hook 1 has completed its movement and returns into the position shown the tail of the lever 16, by pressing upon the inclined plane formed at the end of the catch 19, makes the latter pivot about its axis until it engages with it.

3. Thread holding and tensioning mechanism (Figs. 1 and 3).

The object of this mechanism is to keep the thread taut by nipping it when the needle descends and until its eye reaches the level of the fabric, thus preventing the thread from being carried along by the needle and from being able to form loops upon the back of the fabric and on the contrary ensuring that it will be tightly drawn down on the latter.

When the needle, in rising, passes out from the fabric this mechanism draws back the excess of thread so as to secure the uniformity in length of the loops.

This mechanism is composed of three levers 23, 24 and 25 pivoting independently about the same pivot 26 secured upon the head 27 of the machine. The cylindrical jaws 28, 29 are rigid with the levers 23 and 24 respectively.

The lever 23 rigid with the jaw 28 is extended in a tail piece 30 oscillating between the stops 31, 32 secured upon the head 27 and limiting the stroke drawing back the excess of thread.

Its jaw 28 is pulled downward by the coil spring 33 acting on the tail 30.

The lever 24 rigid with the jaw 29 which is pulled against the jaw 28 by the coil spring 34 is actuated at the desired moment by the stop 35 rigid with the lever 25 the movement of which is produced by the needle carrying rod or bar 36 through the medium of the slot 37 and the roller 38 on the lever 25.

The spring 34 must be more powerful than the spring 33 of the lever 23 as their directions of action are opposed and the lever 24 must, when the jaws 28, 29 are in contact, move the lever 23.

When the machine is stopped with the needle at the top of its stroke the unlocking pin 39 rigid with the tappet 40 formed upon the rod 41 which carries the cloth presser or foot acts, when the latter is raised by means of the eccentric lever 42, upon the tail piece 43 on the lever 24 and separates the jaws 28, 29 in order to release the thread and thus facilitate the removal of the fabric.

4. Device for drawing thread from the bobbin.

The object of this device is to draw automatically from the bobbin the required quantity of thread for a stitch so that the force which is sometimes necessary for this pull will not have to be produced by the needle itself during its down stroke and so that the resistance offered by the thread will not be able, by making the loop engaged upon the hook 1 slide, to shorten the preceding loop.

Upon the lug 44 on the head 27 of the machine are secured three cylindrical guides 45, 46, 47 and a bent rod 48 forms a fork 49 with the top of the needle carrying bar 36 with which it is rigid.

The thread 50 coming from the bobbin passes under the guide 45 then into the fork 49 and afterwards under the guide 46 and over the guide 47 in order to proceed to the needle by passing through the jaws 28, 29.

When the needle rises and the bottom of the fork 49 reaches the level of the under side of the guides 45, 46 the pull is exerted upon the thread 50 which being at this moment nipped by the jaws 28, 29 can only be drawn from the bobbin side.

5. Arrangement of the needle plate and of the toothed feed dog carrying along the fabric (Figs. 2, 4 and 7).

In order to permit the loops to pass out without obstruction and without any danger of becoming unravelled in proportion as the fabric 14 advances, the needle plate 51 comprises, behind the needle, a slot 52 the continuation 53 of which is extended in the bed 54 of the machine.

The toothed dog 55 carrying along the fabric is also for this same purpose sufficiently deeply hollowed out on the side on which the loops pass out.

The operation of the machine is as follows:

The fabric having been placed on the machine with the reverse side upwards and the cloth holder lowered, the needle which was at the top of its stroke descends and liberates the thread 50 which has been drawn from the bobbin and slides along this thread which

at this moment will descend towards the bottom from the jaws 28 and 29 which are gripped together by the action of the spring 34 of the lever 24 and the stop of the lever 23 the tail 30 of which is pressed against the stop 31.

When the eye of the needle 11 reaches the level of the fabric 14 the stop 35 of the lever 25 by acting upon the lever 24 makes the jaws 28, 29 move down still gripped together by the action of the spring 33 of the lever 23 until the tail 30 of the lever 23 by bearing upon the stop 32 causes the jaws 28, 29 to open in order to allow the free passage of the thread 50.

When the needle is at the bottom of its stroke the tappet 9 of the oscillating shaft 10 strikes the stop 8 and moves the looping hook 1 away from the needle after which it allows it to return to its initial position when the needle has slightly risen and has formed a loop in the thread in which the looping hook 1 becomes engaged and holds.

The needle continues to rise and the jaw 29 of the lever 24 approaches the jaw 28 of the lever 23 in order to grip the thread 50 and draw in the excess until the tail 30 of the lever 23 is stopped by the stop 31. At this moment the stop 35 of the lever 25 abandons the lever 24 and the jaws 28 and 29 remaining gripped together, and the thread is drawn from the bobbin by the action of the fork 49 rising above the guides 45, 46.

When the needle again reaches the bottom point of its travel the looping hook 1 leaves the loop already formed, cutting it if the device provided for in this case is fitted to the machine, in order to enter the new one formed by the needle, and so on.

It is easy to see that when a first row of loops or pile threads have thus been sewn on to the fabric around an outline of a design previously drawn or traced upon the fabric by known methods, it is sufficient to fill in the required parts of the design by sewing parallel rows of loops or pile threads at the desired spacing in order to obtain after mechanical or hand cutting new embroidery effects having a very fine appearance and of infinite variety.

It is to be noted that as the velvet is obtained by a thread sewn at regular intervals tightened down against the fabric on the one side and forming loops on the other side which are cut either by the machine itself as they are formed or at the completion of the work by hand, with scissors or by any other means, it will be easy to cut the pile of the velvet so as to make it present shapes and relief which are suited to the design it is desired to produce.

It is clear that the length of the loops or of the pile thread may be varied as desired very easily since the looping hook is adjustable.

What I claim is:

1. In a sewing machine for forming a pile upon fabrics, a needle for sewing a pile thread at regular intervals into and through a fabric, a loop-forming element engageable with the portion of said thread which is passed through said fabric, means controlling said element to retain it in engagement with a loop formed thereby until said needle has completed its down-stroke in the formation of a succeeding loop, means thereupon operable to move said loop-forming element into engagement with said next succeeding loop which is being formed, and means actuated during the movement of said loop-forming element from one loop to a succeeding one to cut the former loop.

2. In a sewing machine for forming a pile upon fabrics, a needle for sewing a pile thread at regular intervals into and through a fabric, a loop-forming element engageable with the portion of said thread which is passed through said fabric, means controlling said element to retain it in engagement with a loop formed thereby until said needle has completed its down-stroke in the formation of a succeeding loop, means thereupon operable to move said loop-forming element into engagement with said next succeeding loop which is being formed, and a cutter carried by said loop-forming element and actuated during the movement thereof from a finished loop to one being formed to cut the former loop.

3. In a sewing machine for forming a pile upon fabrics, a needle for sewing a pile thread at regular intervals into and through a fabric, a support, a loop-forming element pivoted to said support and engageable with said thread to hold the same while a loop is being formed by said needle, means to retain said element in engagement with a formed loop until a next succeeding loop has been partially formed, an oscillatory member thereupon operable to move said loop-forming element about its pivot to release the same from the formed loop and control its engagement with the one being formed, and a cutter carried by said loop-forming element and actuated by the movement thereof from the finished loop to cut the same.

4. In a sewing machine for forming a pile upon fabrics, a needle for sewing a pile thread at regular intervals into and through a fabric, a support, a loop-forming element pivoted to said support and engageable with said thread to hold the same while a loop is being formed by said needle, means to adjust said support in a direction longitudinally of the movement of said needle to regulate the length of loop formed by said element, means to retain said element in engagement with a formed loop until a next succeeding loop has been partially formed, and an oscillatory

member thereupon operable to move said loop-forming element about its pivot to release the same from the formed loop and control its engagement with the one being formed.

In testimony whereof I have affixed my signature.

FERDINAND DELPLANQUE.