

April 3, 1934.

H. GHILARDI

1,953,801

EMBROIDERING MACHINE

Filed Nov. 2, 1933

2 Sheets-Sheet 1

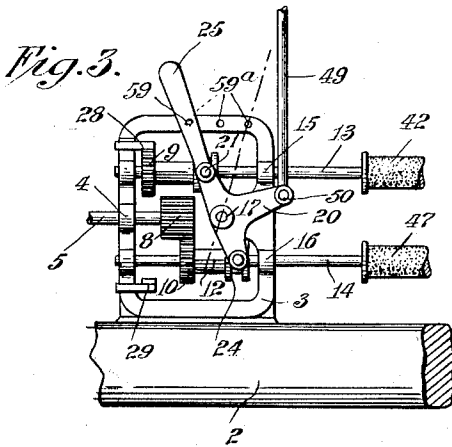
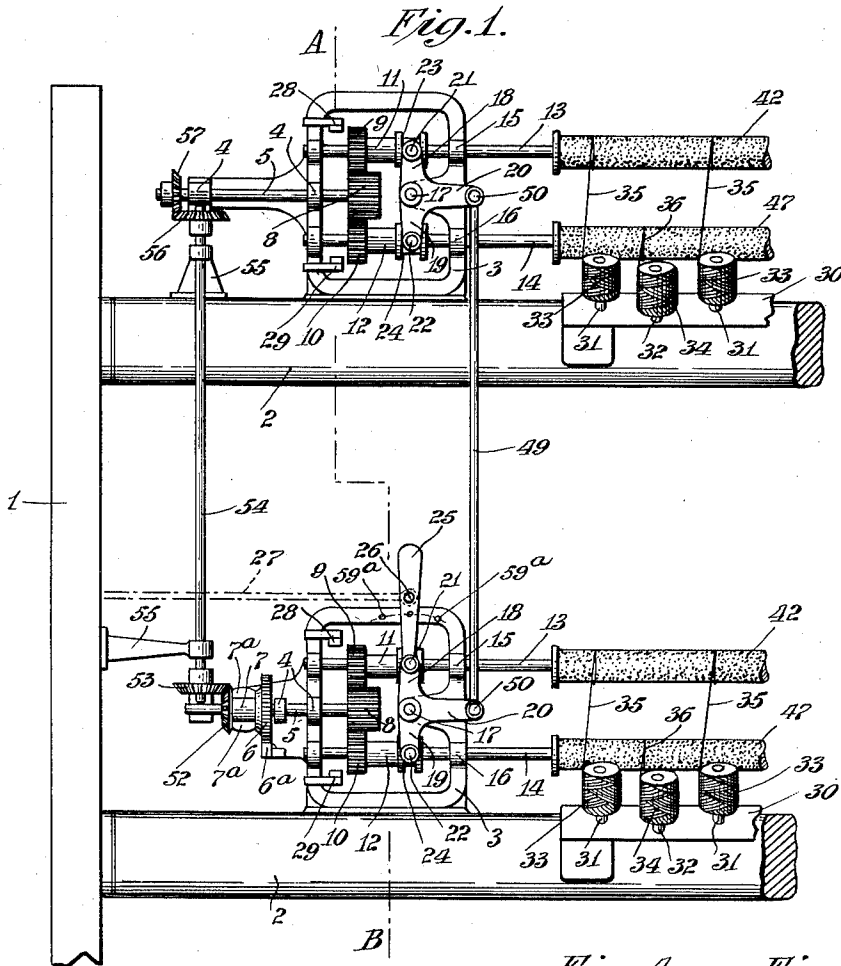


Fig. 4.

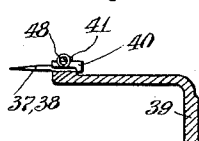


Fig. 5.

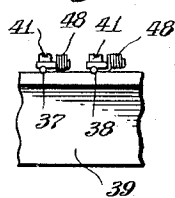
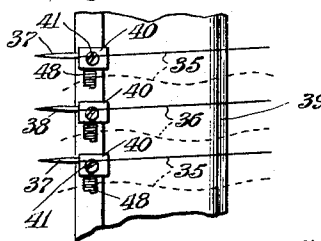


Fig. 6.



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2 Sheets-Sheet 2

Fig. 2.

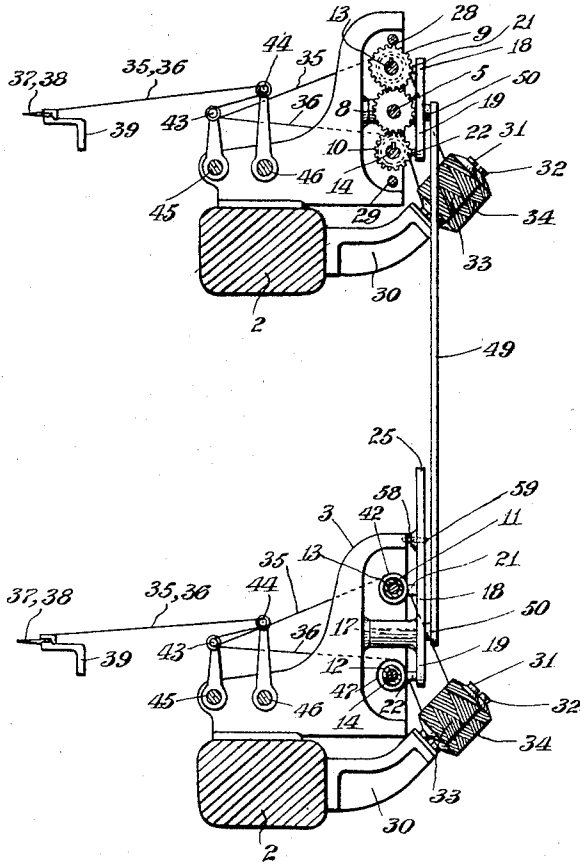


Fig. 7.

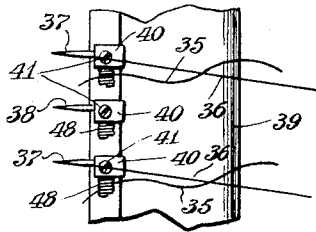


Fig. 8.

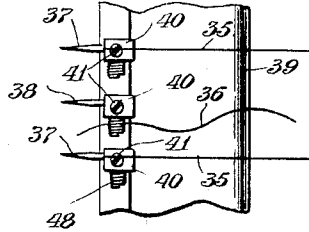
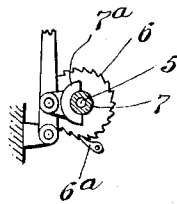


Fig. 9.



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EMBROIDERING MACHINE

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In Germany November 28, 1932

7 Claims. (Cl. 112—83)

In embroidering machines intended for the simultaneous execution upon a base fabric of many repetitions of a unit of design, such as the repetition, for example, of a leaf or a flower, the embroidery threads are commonly led from the supply spools about a roughened (usually emery coated) thread roll which, under the control of a brake, permits the threads to be drawn, under suitable tension imposed by the brake, from the spools as the threads are taken up in the movement of the needles to which the threads pass from the thread roll. When two or more threads of different colors enter into the formation of each design unit it has been necessary, heretofore, in changing from threads of one color to threads of another color, to draw the threads of one color from the eyes of the needles and to replace them by the threads of the other color. This operation takes much time and moreover the loose ends of the disengaged threads often occasion much trouble. To overcome these disadvantages there is provided, in accordance with the present invention, a plurality of thread rolls, one for the threads of one color and another for the threads of the other color or for each other color if more than two colors are used and instead of applying a separate braking device to each thread roll provision is made whereby either or both of the thread rolls can be placed, at the will of the operator, in operative relation with a braking device common to both. If the threads of both colors are to be used at the same time, the threads of one color passing through certain of the needles while the threads of the other color pass through the other needles, both thread rolls are placed in operative relation with the common braking device and the threads are therefore drawn off under proper tension in the movement of the needles. If, in the production of a part of each design unit, the threads of one color only are to be used, the thread roll which controls the tension of the threads of that color is placed in operative relation with the braking device and the other thread roll is disengaged from the braking device. The threads of the color which is not used are withdrawn from the corresponding needles and provision is made for retaining the ends of such threads in position convenient for rethreading and provision is also made for preventing positively the rotation of the corresponding thread roll so that for the time being no threads of the corresponding color can be drawn from the spools. The provision of means whereby both or all of the thread rolls can be placed simultaneously in operative relation with the

common braking devices makes it possible, if so desired, to embroider several different design units with threads of different colors or different thicknesses all under proper tension. If the embroidering machine has several groups of thread rolls, each arranged for the control of threads from a corresponding group of spools, provision is made whereby the thread rolls of all groups may be placed simultaneously in operative relation with the braking devices common to the thread rolls of each group.

The invention will be more fully explained hereinafter with reference to the accompanying drawings, more or less schematic in their character, which illustrate an embodiment of the invention in an embroidering machine equipped with two groups of thread rolls and their associated parts, each group having two thread rolls, the machine being therefore adapted for the use of threads of two colors.

In the drawings:

Figure 1 is a view in front elevation of a portion of such an embroidering machine.

Figure 2 is a view in vertical section on the irregular plane indicated by the broken line A—B of Figure 1.

Figure 3 is a detail view showing some of the parts of the shifting mechanism in a position different from that shown in Figure 1.

Figures 4, 5 and 6 are detail views on a larger scale illustrating particularly the devices for holding the thread ends in convenient position for the rethreading. Figure 4 being a view in vertical, sectional elevation, Figure 5 is a view in front elevation, and Figure 6 a view in plan, the threads being shown in full lines as engaged with consecutive needles.

Figures 7 and 8 are views similar to Figure 6, but showing the threads in different relations with the needles.

Figure 9 is a detail view in vertical section of the braking device shown in Figure 1.

The frame of the embroidering machine is provided as usual with upright supports, one of which is shown at 1 in Figure 1, and with horizontal supporting beams 2. Upon each supporting beam 2 is mounted a frame 3 in bearings 4 of which is rotatably supported a shaft 5. As shown in Figure 1, one at least of the two shafts 5, in this instance the lower shaft is provided with a ratchet wheel 6 with which cooperates a pawl located at 6^a so that rotation of the shaft 5 and its associated elements is permitted in one direction only. The hub 7 of the wheel 6 has cooperating therewith a friction brake 7^a of ordinary

construction which applies a braking action upon the shaft 5 and therefore upon the thread rolls when in operative relation with such braking device through the shaft 5. Also secured to the shaft 5 is a wide gear 8 adapted to be engaged by one or the other or both of two gears 9 and 10 carried by longitudinally movable sleeves 11, 12 which are splined on the shafts 13 and 14 to which are secured respectively the thread rolls 42 and 47. The sleeves 11, 12 are annularly grooved, as at 23, 24, for engagement by pins 21, 22 carried by the arms 18, 19 of a three-armed lever pivoted on the frame, as at 17, and having each a third arm 20, the two arms 20 being connected to move together by a link 49 pivotally connected to the respective arms 20, as at 50.

One of the three-armed levers 17, 18, 19, such as the lower one of the two, as shown in Figure 1, is provided with an operating handle 25 by means of which the operator can shift the gears 9 and 10 to cause both of them to mesh with the gear 8, as shown in Figure 1, or to cause one or the other, such as the gear 10, as shown in Figure 3, to mesh with the gear 8, while the other, such as the gear 9, in Figure 3, is moved into engagement with a fixed detent 28. Movement of the operating handle in the opposite direction to its extreme position shifts the gear 10 out of engagement with the gear 8 and into engagement with a fixed detent 29. The operating handle may be provided with a spring detent of ordinary character, as at 59, for engagement with one of three recesses 59^a in the frame 3 for the purpose of facilitating the correct positioning of the operating handle and the three-armed lever. If desired, the operating handle may be connected by a link 27, shown in broken lines in Figure 1, with a portion of the automat, that is, the well-known pattern chain-controlled mechanism for controlling automatically the operation of the embroidering machine, so that the change from the color to the other may be determined automatically.

On each horizontal frame member 2 is secured a plate 30 on which are supported the spindles 31 which receive the spools 33 of thread of one color, such as blue, for example, and the spindles 32, only one of which is shown, on which are supported the spools 34, only one of which is shown, of thread of the other color used, such as yellow, for example. The threads of one color, such as the blue threads 35, are carried around one of the thread rolls, such as the thread roll 42, and the threads 36, such as the yellow threads, are carried around the thread roll 47.

In the embodiment of the invention shown the two groups of thread rolls 42, 47 and their associated parts are coupled so that the rolls of both groups may be controlled simultaneously, that is, may be simultaneously engaged with or disengaged from the respective braking devices of the two groups. To accomplish this the shaft 5 of the lower group has secured thereto a bevel gear 52 which meshes with a corresponding bevel gear 53 at the lower end of a shaft 54 mounted in bearings supported by brackets 55 on the frame members 1 and 2. At the upper end of the shaft 54 is secured a bevel gear 56 which meshes with a corresponding bevel gear 57 on the shaft 5 of the upper group.

It will be understood that in the operation of the mechanism as thus far described the threads 35, 36 are, through the forward movement of the needle carriages 39, drawn from the spools 33, 34, and that the thread rolls 42, 47 are rotated thereby, except as hereinafter indicated. By means

of the operating lever or handle 25 the gears 9 and 10 of each group are shifted so as to cause both gears 9 and 10 to mesh with the gear 8 of the common braking device, or to cause the gear 10 to mesh with the gear 8 while the gear 9 is caused to engage with the stop 28, as shown in Figure 3, or to cause the gear 9 to mesh with the gear 8 while the gear 10 is caused to engage with the fixed stop 29, as will be understood without specific illustration. When the control or operating lever 25 is in the middle position, as shown in Figure 1, both of the thread rolls, 42, 47 of each group have their gears 9, 10 in mesh with the gear 8 and are therefore coupled with the braking device common to the two rolls of each group. Under these conditions both blue threads 35 pass about the roll 42 and thence to the needles 37 and the yellow threads 36 pass about the thread roll 47 to the needles 38, all as indicated in Figure 6. If the design units are to be stitched for the time being only with the yellow threads 36, which are threaded into the corresponding needles 38, all the blue threads 35 are withdrawn from the needles 37 when the machine is at rest and through movement of the lever 25 into the left hand position the gears 10 are continued in mesh with the gears 8 while the gears 9 are disengaged therefrom and are held from rotation, together with the corresponding thread roll 42, through engagement of the gears 9 with the detents 28. The machine being then set in motion the design units are embroidered with yellow thread only. Similarly, when a change is to be made to blue threads 35, the machine is stopped, the yellow threads are withdrawn from the corresponding needles, the blue threads are threaded into the corresponding needles, the gears are shifted by movement of the lever 25 to its extreme right hand position, the thread roll 42 is coupled to the braking device through the engagement of the gear 9 with the gear 8, and the thread roll 47 is held positively against rotation through engagement of the gear 10 with the detent 29.

The ends of the threads which have been withdrawn from the needles, if left loose, might become entangled, and the work of rethreading them into their respective needles would become difficult. To overcome this disadvantage there is secured adjacent to the block 40 which supports each needle a short spring coil 48, between the coils of which the corresponding thread may be introduced, as indicated by broken lines in Figure 6 and by full lines in Figures 7 and 8, and is held until such time as it is required for the rethreading. Such wire clip or thread holder may be conveniently secured in place by extending one end of the wire between the needle block or base 40 and the needle carriage 39 to be held there when the block or base is pressed down upon the carriage by the securing screw 41.

It will be understood that the threads 35 and 36 may be passed as usual from the thread rolls 42, 47 to the needles 37, 38 about thread guides 43, 44, mounted as usual upon the frame members.

It will be understood that various changes in construction and arrangement can be made to suit different conditions of use and that, except as indicated in the accompanying claims, the invention is not restricted to the particular construction shown and described herein.

I claim as my invention:

1. In an embroidering machine, the combination of a plurality of thread rolls about which threads of different characteristics may be passed from the sources of supply, a needle carriage, nee-

dles to which the threads may be led from the respective thread rolls, a braking device, and means whereby one of the thread rolls may be brought into operative relation with the braking device while the other is disengaged therefrom.

2. In an embroidering machine, the combination of a plurality of thread rolls about which threads of different characteristics may be passed from the sources of supply, a needle carriage, needles to which the threads may be led from the respective thread rolls, a braking device, means whereby one of the thread rolls may be brought into operation with the braking device while the other is disengaged therefrom, and means whereby the disengaged thread roll is held positively from rotation.

3. In an embroidering machine, the combination of a plurality of thread rolls about which threads of different characteristics may be passed from the sources of supply, a needle carriage, needles to which the threads may be led from the respective thread rolls, a braking device, and means whereby two thread rolls may be brought simultaneously into operative relation with the braking device and simultaneously disengaged therefrom.

4. In an embroidering machine, the combination of a plurality of thread rolls about which threads of different characteristics may be passed from the sources of supply, a needle carriage, needles to which the threads may be led from the respective thread rolls, a braking device including a wide gear, gears in operative relation with the thread rolls respectively and relatively movable longitudinally, and means to shift said last named gears into and out of engagement with the first named gear.

5. In an embroidering machine, the combina-

tion of a plurality of thread rolls about which threads of different characteristics may be passed from the sources of supply, a needle carrier, needles to which the threads may be led from the respective thread rolls, a braking device including a wide gear, gears in operative relation with the thread rolls respectively and relatively movable longitudinally, means to shift said last named gears into and out of engagement with the first named gear, and detents into engagement with which said last named gears are moved as they are disengaged from said first named gear.

6. In an embroidering machine, the combination of a plurality of thread rolls about which threads of different characteristics may be passed from the sources of supply, a needle carriage, needles to which the threads may be led from the respective thread rolls, a braking device including a wide gear, gears in operative relation with the thread rolls respectively and relatively movable longitudinally, means to shift said last named gears into and out of engagement with the first named gear, and thread clips adjacent to the needles and with which the threads may be engaged when withdrawn from the needles.

7. In an embroidering machine, the combination of a plurality of groups of thread rolls about which threads of different characteristics may be passed from the source of supply, a plurality of needle carriages, needles to which the threads may be led from the respective thread rolls, a common braking device, and means whereby one of the thread rolls of each group may be brought into operative relation with the braking device while the other thread-roll of the same group is disengaged therefrom.

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40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150