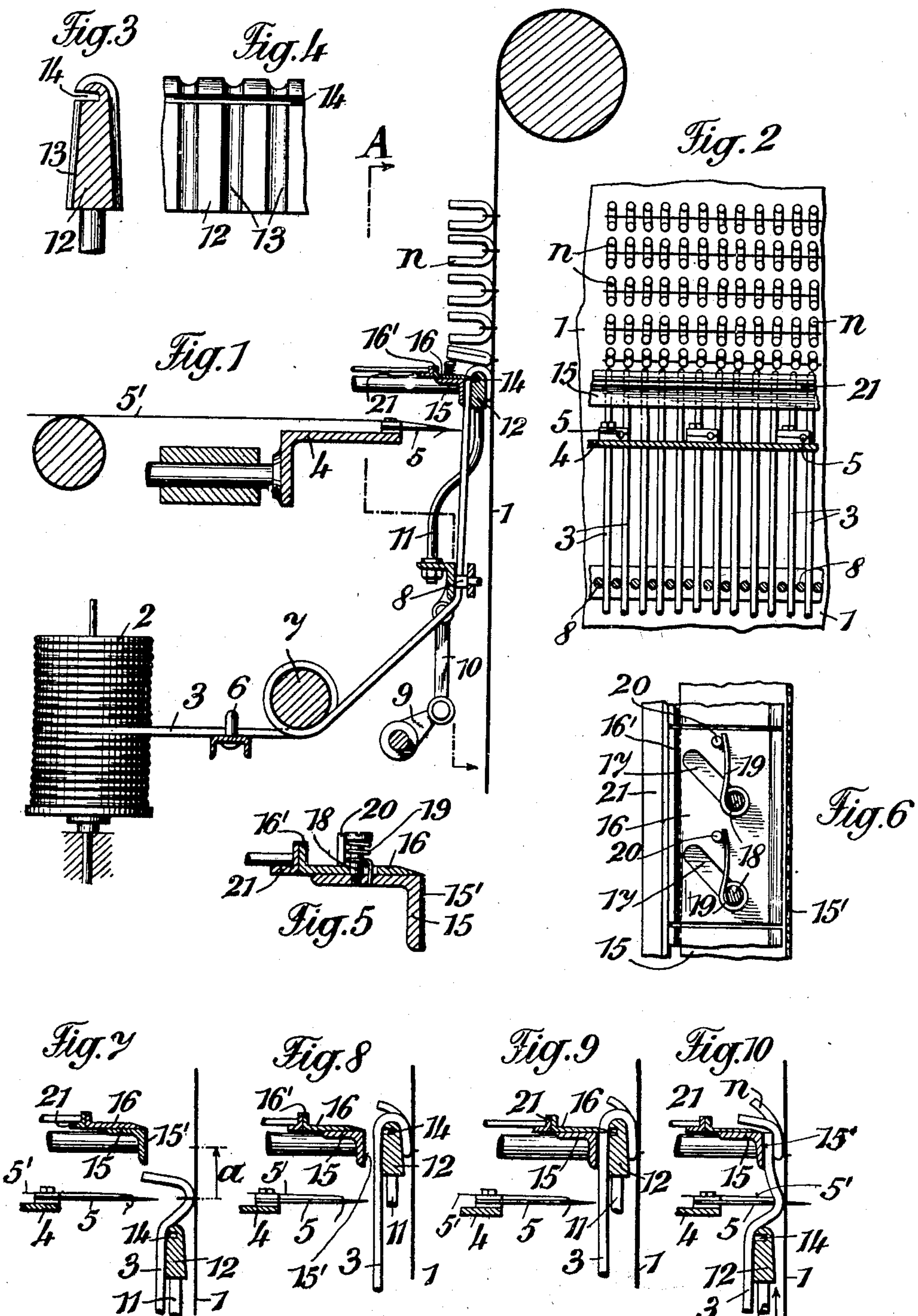
H. HARDEGGER.

MANUFACTURE OF PILE CARPETS.

APPLICATION FILED MAY 4, 1909.

1,069,330. Patented Aug. 5, 1913.



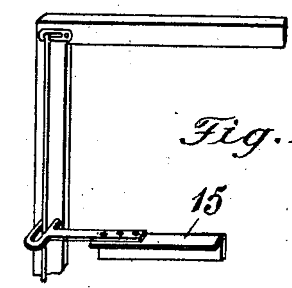


Fig. 11.

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MANUFACTURE OF PILE CARPETS.

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To all whom it may concern:

Be it known that I, HANS HARDEGGER, a citizen of the Republic of Switzerland, residing at Arbon, Berglistrasse, Switzerland, have invented certain new and useful Improvements in the Manufacture of Pile Carpets; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in the manufacture of pile carpets which are imitated knotted carpets, that is, imitations of the oriental carpets, and of two types, the Smyrna and the Turkish.

According to my invention separate rows of loops of pile-threads parallel to the rows of needles are formed after one another on the ground of the carpet in the frame of an embroidering machine and sewed thereon by the needles of the embroidering machine.

One form of construction of the embroidering machine for practising the invention is illustrated in the accompanying drawing, in which—

Figure 1 is a vertical section through the embroidering machine; Fig. 2 is a section on the line A—B of Fig. 1; Figs. 3 to 6 are details of the embroidering machine drawn to an enlarged scale. Figs. 7 to 10 show the operation in different successive stages. Fig. 11 is a detail.

1 is the ground of the carpet formed by a fabric web and stretched on the frame of a shuttle-embroidering machine, and 2 are the bobbins on which the pile threads are wound. The needle-bar with the needles 5 in which the threads 5′ are threaded is movable perpendicularly toward the carpet-ground. For forming the binding stitches, shuttles on the back of the carpet-ground (which are not shown on the drawing) cooperate with the needles 5 in the well known manner. The pile threads 3 are guided through a stationary guide 6 and around a tension roller 7 covered with emery, and through a second guide 8, this latter being movable up and down independently of the ground of the carpet, and supported from levers 9 by links 10. A horizontal flat bar 12 is connected edgewise to the guide 8 by means of rigid rods 11. The flat bar 12, therefore, makes the same movement with reference to the ground 1 as the guide 8, and extends across the whole width of the ground 1, its thickness diminishing toward its upper rounded longitudinal edge. This bar 12 is provided with parallel vertical grooves 13, which extend over the rounded upper edge from the front to the back of the bar, and on the side turned away from the carpet ground 1 the bar 12 is provided with a groove 14 extending longitudinally of said bar (Figs. 3 and 4) at or just below the rounded upper edge.

Over the needle-bar 4 and parallel to it there is arranged an L-shaped iron bar 15, movable at right angles to the carpet ground. This bar has on one of its ends a fork, which passes over a rod secured to the frame of the machine carrying the carpet ground and occupying a vertical position in the machine, so that said bar 15 is drawn with the frame on the horizontal movement of the latter, but is not influenced by the vertical movement of the frame, (Fig. 11). On the side turned toward the ground 1 the bar 15 is provided with a roughened face 15′ (Fig. 5) which is destined to operate in conjunction with the bar 12, to engage and hold the pile threads as the bar 12 moves down. On the bar 15 separated flat knives 16 are placed in juxtaposition. These knives are furnished with inclined slots 17 through which pass the shafts of screw-bolts 18 fixed on the bar. Around the shafts of the screw-bolts are placed spiral springs 19, working both as compression and torsion springs, the upper ends of said springs engaging the heads of the bolts 18, and their other ends pressing rearward and downward the knives 16 on the bar 15.

The knives 16 are furnished with flanges 16′ at their rear edges, by means of which and under the action of the springs 19, which engage the pins 20, they are pressed toward the L-shaped iron bar placed behind the knives and movable perpendicularly toward the carpet-ground, (Figs. 5 and 6). The pile threads 3 are held side by side on the carpet ground proportionally to the spacing of the grooves 13 in the bar 12, while the needles 5 are distanced from each other proportionally to the distances of repeating of the embroidering machine.

With the embroidering machine shown in the drawing and described in the foregoing,

horizontal rows of loops or piles extending over the whole width of the carpet ground can be sewed on the carpet ground one after another and cut off by the knives 16 from the pile threads.

Starting from the position of the elements operating together as shown in Fig. 7, the succession of different operations is now as follows: When, after having sewed on the carpet-ground a row of piles or loops, the needle bar 4 has been moved backward, the frame with the carpet ground will be moved vertically upward from the pantograph a distance *a* equal to the distance between the two rows of piles. The bar 12 with the pile threads 3 in the grooves 13 now moves upward till the groove 14 comes into the plane of the knives 16 (Fig. 8). The pile threads forming loops or piles are thus placed around the rounded upper edge of the bar 12. The knives 16 are now displaced toward the bar 12 by the bar 21 in opposition to the action of the springs 19, and by reason of the arrangement of the oblique slots 17 they execute a movement in a direction inclined to the bar 12, enter the groove 14 and cut the parts of loops held in front of them from the pile threads. The loops cut off and sewed on the carpet ground substantially at their middle form now the first row of loops *n*. During this latter operation the ends of the loops forming the second row below the place where the first row of loops has been cut are held between bar 12 and bar 15. The bar 12 now moves back to its lower position, while at the same time the bar 15 is moved still farther toward the carpet ground holding the loops between itself and the said ground 1. The needle-bar now moves toward the carpet ground and sews the loops onto it (Fig. 10). When the bar 12 moves back into its lower position the roughened face 15′ prevents the ends of the threads from being drawn downward by the bar 12. The described operation is now repeated, for after raising the frame with the carpet ground the distance *a* and after forming a new row of loops by the bar 12 rising again, the loops are cut off by the knives 16, so that a new row of loops is formed, *i. e.*, has been fastened to the ground 1, and so on, until the whole length of the ground is covered with rows of loops *n*.

With the embroidering machine hereinbefore described it is possible by means of successive horizontal and vertical displacements of the frame with the carpet ground thereon and operated from the pantograph of the embroidering machine, to sew several superposed rows of loops on the carpet ground, or to sew the loops of each row on the ground with several stitches.

I claim—

1. In an embroidering machine for the manufacture of imitation knotted carpets, the combination with ground-fabric holding means, of a row of sewing mechanisms, means to feed a row of pile threads between the sewing mechanisms and ground fabric to be sewed to the latter by the former, means to form loops in the threads and means to cut the pile from the pile thread supply after the sewing operation.

2. In a machine for the manufacture of imitation knotted carpets, the combination with ground-fabric holding means, of a transverse row of sewing mechanisms in operative relation thereto, means to hold the ends of a row of pile threads in position to be sewed by the sewing mechanisms, a bar movable between the pile thread holding means and the ground fabric to form loops in the pile threads and over which the pile threads are guided and means to cut the pile loops from the pile thread supply after the sewing operation and the forming of the pile loops.

3. In a machine for the manufacture of imitation knotted carpets, the combination with ground-fabric holding means, of a transverse row of sewing mechanisms, means to supply pile threads to the sewing mechanisms to be sewed to the ground-fabric in transverse rows, a horizontal vertically movable bar to form loops in the pile threads, and a row of cutting mechanisms coöperating with a longitudinal groove in the bar to cut the pile loops from the pile thread supply after they have been sewed to the ground-fabric.

4. In a machine for the manufacture of imitation knotted carpets, the combination with ground-fabric holding means, of a vertically movable bar having a longitudinal groove therein, a row of sewing mechanisms, means to supply pile threads to the sewing mechanisms, a row of cutting mechanisms coöperating with the bar and groove to cut the pile loops formed by the bar from the pile thread supply after the sewing operation, and means to hold the ends of the pile threads after the loops have been cut therefrom, for sewing the next row of loops to the ground fabric.

5. In a machine for making imitation knotted carpets, the combination with ground-fabric-holding means; of sewing mechanism, means to supply pile thread between the sewing mechanism and ground-fabric and having a longitudinal groove therein and over which the pile threads lie preparatory to being cut, a second bar to hold the pile threads against the first bar, a spring-retracted knife on the second bar and means to move the knife into the groove of the first bar.

6. In a machine for making imitation knotted carpets, the combination with ground-fabric-holding means; of means to

sew pile threads to the ground, a vertically movable bar having a longitudinal slot over which the pile threads are held, a cutter bar, knives having inclined slots thereon, bolts in the bar and passing the slots of the knives, springs on the bolts to normally hold the knives retracted and means to engage the knives and move them into the groove in the first mentioned bar, said knives having a diagonal movement by reason of their inclined slots.

7. In a machine for making imitation knotted carpets, a knife bar having a roughened pile-thread engaging face, knives having inclined slots, bolts in the bar and passing through the slots, coil retracting springs on the bolts, and pins on the knives against which one end of each of said springs acts, the other end of said springs being secured in the bar.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

HANS HARDEGGER.

Witnesses:
ERNST FISCHER,
CARL GUBLER.