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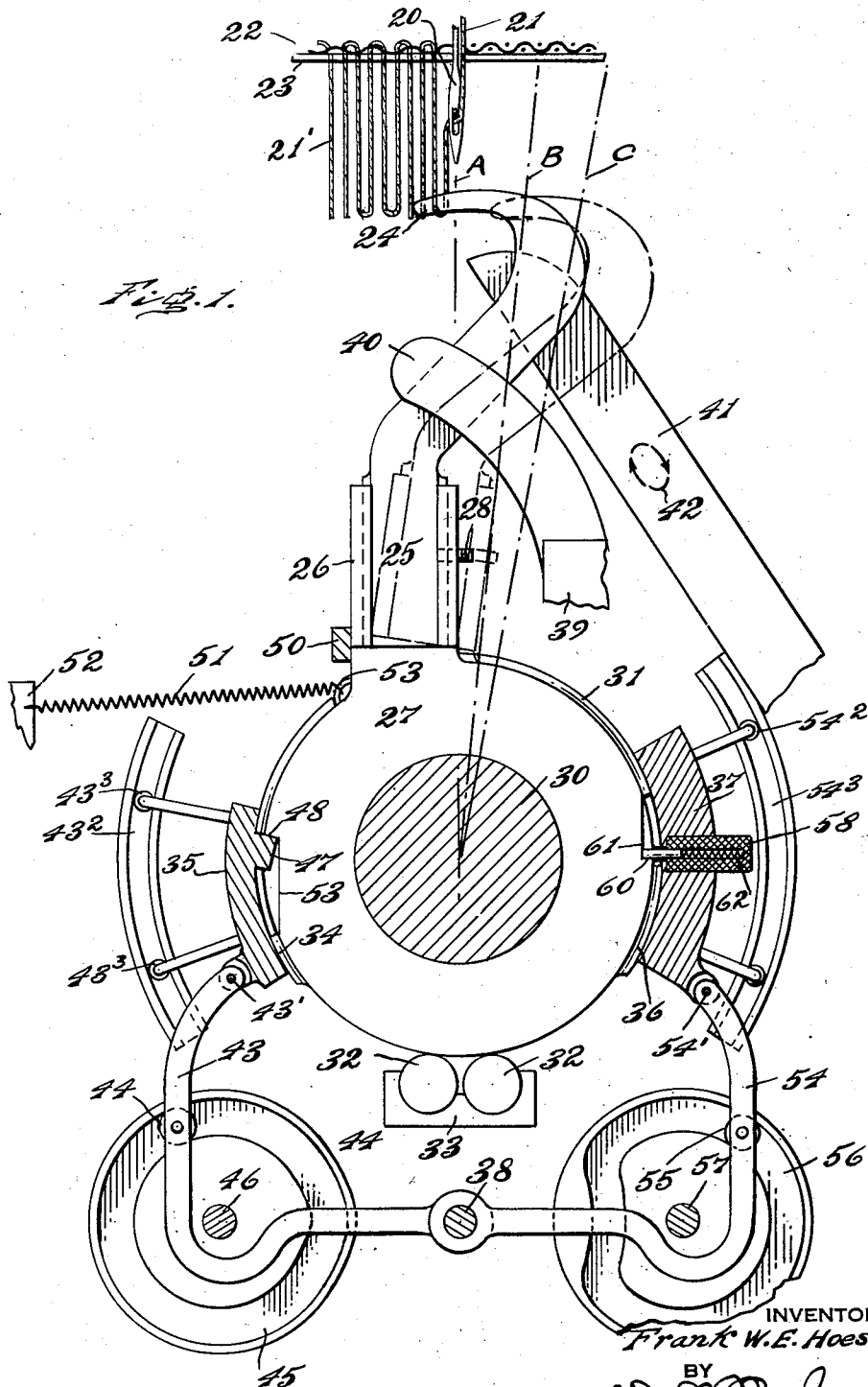
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2,882,845

TUFTING PATTERN CONTROLLED BY LOOPER

Filed July 5, 1955

2 Sheets-Sheet 1



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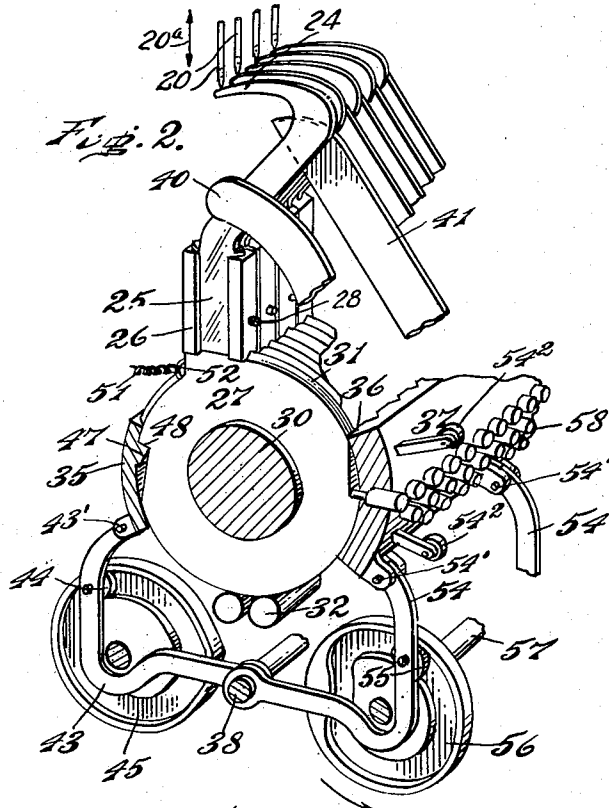
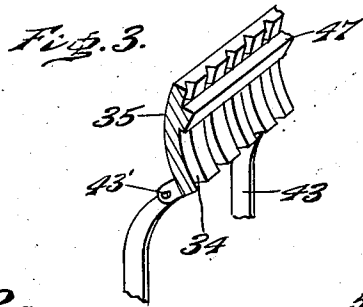
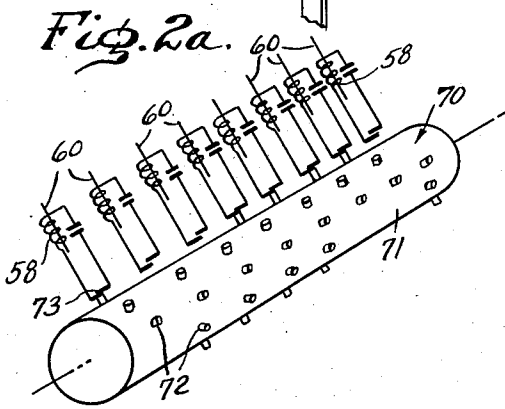
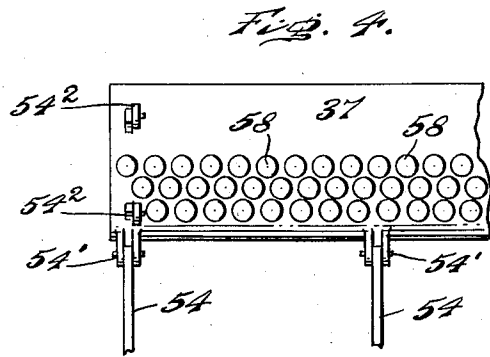
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2 Sheets-Sheet 2



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TUFTING PATTERN CONTROLLED BY LOOPER

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4 Claims. (Cl. 112-79)

The present invention is designed for control by looper action of the tufting where a group or gang of needles carrying individual yarn ends force loops of yarn through a backing fabric to form pile projections in a carpet, rug or the like.

A purpose of the invention is to permit the control at will of the character of pile projections formed by an individual yarn end, so as to permit for example selective production of cut pile or uncut pile or selective production of pile of different characters, for example different heights.

The invention is believed to find its widest application in the formation of pile of cut and uncut character in accordance with a pattern control mechanism.

Figure 1 shows a diagrammatic section transverse to the length of the needle bar, showing the looper structure employed in the present invention.

Figure 2 is a perspective of the mechanism of Figure 1.

Figure 2a is a schematic representation of a master pattern control.

Figure 3 is a fragmentary interior perspective of the cut loop position segment.

Figure 4 is a view illustrating the staggering of the solenoids on the uncut loop position segment.

In the prior art it has not been possible to obtain needled pile fabrics having loops which are of different character, such as cut and uncut or high and low, with pattern control so that any individual loop can be made to have either one character or another character. The practice has been instead to produce rows of loops of one character and alternate rows of loops of different character, but without the ability to select and predetermine that any desired loop in a particular row will be of one character and the next loop in that row will be of another character.

By the present invention it is made possible to select any particular loop and determine that it will be of a certain character different from the preceding loop or the following loop in the same longitudinal row, and also from the adjoining loops in the same transverse row. Thus it is possible by the present invention to make all of the loops in one area uncut and all the loops in an adjoining area cut or vice versa, according to any desired figure or design. Likewise it is possible in accordance with the invention to produce high loops in one area and low loops in another area, but, of course, there can be a multiple of variants; for example, the loops in one area may be high uncut loops and the loops in another area may be low cut loops.

The invention is illustrated herein by showing a standard needling machine which may be a Cobble machine and omitting features which are well-known such as the needle bar with its operating mechanism and the yarn feed, and showing features which are new, such as the rocker support of the loopers and the selective motion of the loopers.

The illustration is intended to be diagrammatic, and it

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will, of course, be evident that variations will be produced as required to meet the needs of service.

The needle 20 which is one of a gang of needles on a needle bar (not shown), is moved up and down as indicated by arrow 20a (see Figure 2) along with the other needles 20 by the needle bar and receives yarn 21 from a yarn feed not shown to advance the yarn through a backing fabric 22 resting on a slotted anvil plate 23 as well known to form pile 21'.

Each needle cooperates with a looper or hook 24 which is placed below the anvil plate in conventional practice, and which is manipulated to perform the usual looper functions by engaging in the newly formed loop and holding it as the needle is retracted.

According to the present invention the looper has three positions A, B and C, and, depending upon the particular position achieved, the looper either holds the loop as the needle is retracted, moves the loop to a cutting position, or moves the loop to a remote non-cutting position where the cutter is not able to engage the loop.

In accordance with the invention the looper 24 has a shank 25 remote from its hook end which engages in a slot 26 on a rocker 27, the looper being suitably held in place by setscrew 28. A rocker is individual to each needle position and to each looper, there being a large number of rockers which journal on a common shaft 30 extending from side to side of the machine. Each rocker has circular exterior surfaces 31 and rides on roller bearings 32 supported in a race 33, the roller bearings and races extending in a series from one side to the other of the machine so as to give supplemental journal support to the shaft 30 additional to the bearing support provided at the sides (not shown).

Each of the rockers turns and is guided in an arcuate slot 34 in a cutter segment 35 and also in a similar slot 36 in an uncut loop segment 37. The segments are mounted by links on a transverse shaft 38, on which the links journal.

A supporting bar 39 runs from side to side of the machine and carries a divider 40 for each looper position, the divider extending in and engaging one side of the looper below the hook and preventing deflection of the looper laterally. The other side of the looper is engaged by a cutter 41 which has a restricted range of oscillation back and forth as suggested by the arrows 42. The cutter presses the looper, which is somewhat elastic, against the divider. Normally the cutter will be a flexible element acting like a spring, the looper will have slight flexibility and the divider will be a rigid element.

A cutting segment 35 at intervals along its length is pivotally mounted at 43' by links 43 mounted on the shaft 38. The segment 35 is guided in arcuate tracks 43a by rollers 43b and the tracks are concentric with the shaft 30. The links 43 carry follower rollers 44 which follow a series of identical cams 45 on a transverse cam shaft 46 extending across the machine. The segment 35 has at one end on the inside a ratchet dog 47 which runs the entire width of the machine, and which at each rocker is adapted to engage in a ratchet tooth 48 to manipulate the rocker in a clockwise direction from its position A engaging stop 50 under the retraction of tension spring 51 acting from anchorage 52 to spring abutment 53, to position B. The tooth 48 is relieved at 53 to permit overtravel when segment 37 acts.

Segment 37 at the opposite side pivotally connects at 54' with a series of links 54. The segment 37 is guided by rollers 54a following arcuate tracks 54b concentric with the shaft 30. The links 54 carry follower rollers 55 which engage cams 56 on a cam shaft 57 extending across the machine and at each rocker position the segment 37 carries a solenoid 58 which when energized moves a latch plunger 60 forward to latching engagement in a tooth

notch 61 of the rocker, the latch being retracted by tension spring 62 acting from a suitable anchorage and engaged in the plunger.

Whereas the segment 35 moves between positions A and B, the segment 37 moves from position A to position C. A master pattern control 70 (see Figure 2a) is provided, which may suitably be a rotating cylinder 71 having a series of contacts or having projections 72 which close switches 73, with an electric circuit from a power source to each one of the group of individual solenoids 58. In order to permit close positioning of the solenoids laterally the solenoids are staggered as shown in Figures 2 and 4, and the notches 61 on the respective rockers are placed in angular positions which cooperate with the different solenoids.

In operation after the needle moves down, both segments are retracted by their cams and all of the loopers for all of the needles move toward position A under the action of retracting springs 51. The needle has moved down until its eye is below the looper, and the looper as well known engages the loop of yarn above the eye of the needle in this position.

The needle now moves up or retracts, the looper remaining in position A. As the needle reaches a position adjacent its fully raised position, segment 35 advances carrying all of the rockers with it by engagement in teeth 48, and carrying all of the loopers toward position B. At the same time selection takes place and at any needle position where selection occurs the solenoid 58 is energized by the well-known pattern mechanism, which engages the latch in tooth 61. The pattern control mechanism can be of the well-known character employed in sign flashers or other multiple circuit controlled devices. At the same time the segment 37 advances under the action of its cams, and it carries those rockers which have been selected to position C.

At the time that the loopers have moved to position B or position C as the case may be, and the needle is substantially fully raised, the cutter 42 is energized to oscillate in the upper right hand direction in Figure 1, cutting all loops which are on the loopers in position B. All loops which have moved to position C however are not cut because they have been cast off by the looper at position C and they are no longer held in position where they can be cut.

Thus, as a result two different types of loops are obtained, one of the types being cut and the other being uncut.

It will be evident that the principles of the invention can be applied by moving the looper to one of two or more positions, to pull out the loop to different lengths or otherwise to manipulate the loop, and these principles need not be devoted exclusively to forming cut and uncut loops.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention with-

out copying the structure shown, and I, therefore, claim all such insofar as they fall within the reasonable spirit and scope of my claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Mechanism for producing needled pile fabric including a gang of reciprocable needles and a series of loopers individually cooperating with the respective needles in combination with means for moving the loopers to an initial position beneath the needles to engage yarn advanced by the needles to form loops and to spaced positions respectively where the loops on the corresponding loopers are cut on the loopers and released uncut from the loopers, said means being responsive to pattern control as to which of said loopers take said loop cutting position and said loop releasing position, and cutter means adjacent to the loopers in said cutting position to sever the loops on the corresponding loopers in that position.
2. Mechanism for producing needled pile fabric including a gang of reciprocable needles and a series of loopers individually cooperating with the respective needles, in combination with means for advancing the loopers to an initial position beneath the needles to engage yarn advanced by the needles to form loops and for retracting the loopers to a yarn cutting position on one side of the initial position and moving the loopers farther to said side to a loop releasing position where the corresponding loops are released uncut, said means being responsive to pattern control as to which of said loopers take said loop cutting position and said loop releasing position, and cutter means adjacent to the loopers in said cutting position to sever the loops on the corresponding loopers in that position.
3. Mechanism according to claim 2, in which said means comprises rockers mounting the individual loopers, each of the rockers having notches at the outside, a shaft journalling the various rockers, first means outside the rockers adapted to engage in one of the notches of said rockers, second means having latches adapted to engage in another of the notches of the rockers, means for advancing the first means to move the loopers to said cutting position, means for selectively actuating the latches, and means for advancing the second means including the latches to achieve loop releasing position of the corresponding loopers.
4. Mechanism according to claim 3, in combination with bearings engaging the sides of the rockers remote from the sides at which the needles are located.

References Cited in the file of this patent

UNITED STATES PATENTS

1,772,993	Gruttes	Aug. 12, 1930
1,970,703	Loos	Aug. 21, 1934
1,984,330	Boyce	Dec. 11, 1934
2,411,268	Hamrich	Nov. 19, 1946