

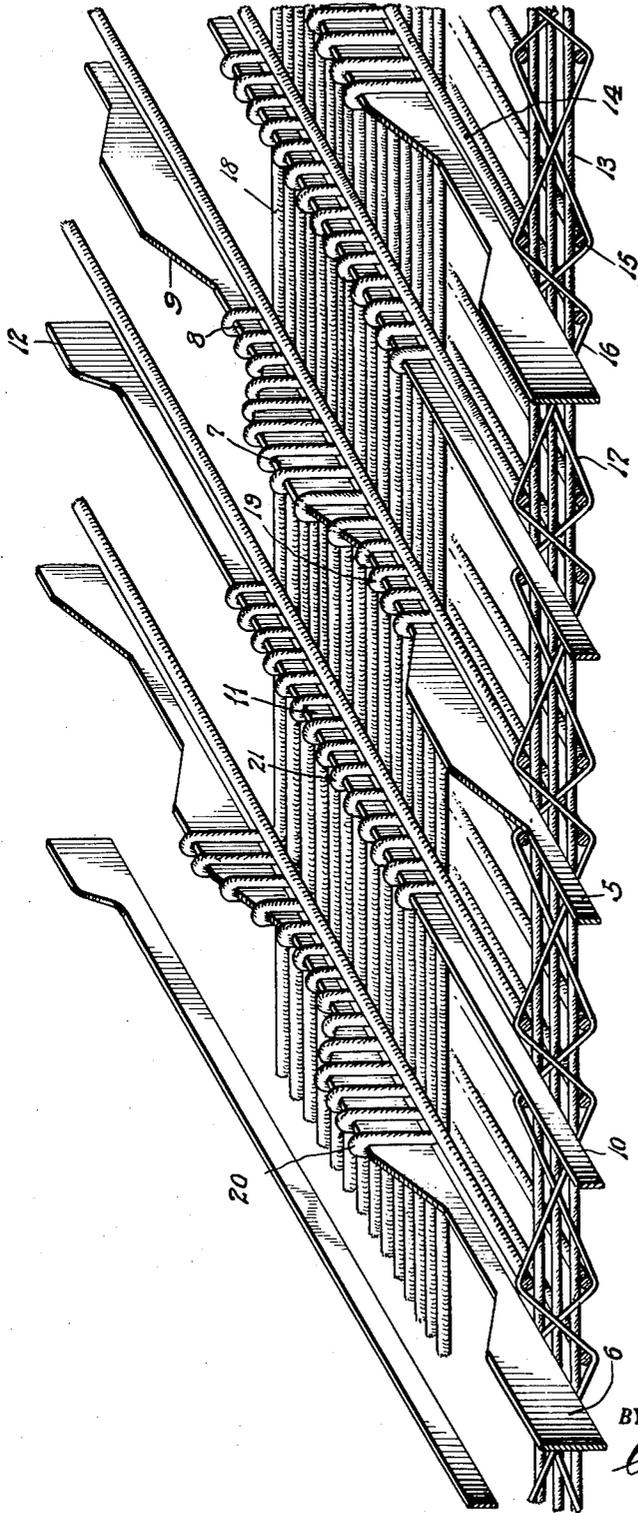
Nov. 6, 1951

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2,573,841

METHOD OF WEAVING LOOP PILE FABRICS

Filed June 16, 1949



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2,573,841

METHOD OF WEAVING LOOP PILE FABRICS

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Application June 16, 1949, Serial No. 99,565

11 Claims. (Cl. 139—39)

1

This invention relates to a method of weaving loop pile fabrics and particularly fabrics in which the loops in some rows are of unequal height.

In my prior application filed April 12, 1948, Serial Number 20,547, now Patent No. 2,546,261, granted March 27, 1951, a method is disclosed for making loop pile fabrics in which the rows of loops are formed on pile wires having high and low loop forming portions, the high portions of each wire being opposite the low portions of the next adjacent wire when inserted in the fabric whereby the withdrawal of a wire will cause the low loops formed thereon to be raised to a height corresponding to the height of the high loops and then when the next succeeding wire is withdrawn the raising of the low loops thereon will reduce the height of the loops in the preceding row opposite the raised loops, the loops in each row being of unequal height.

In practicing the foregoing method difficulty was experienced in withdrawing the special shaped wires continuously. I have found the insertion of a knob wire intermediate the special shaped wires will overcome this objection and will result in a fabric having a texture which is superior and more attractive in appearance than the fabric made by the foregoing method.

In the present method special shaped wires and knob wires are inserted in the fabric during the weaving process with the knob wires intermediate the special wires. The wires are successively withdrawn and upon withdrawal of a special shaped wire, the loops formed on the low portions are raised to a height corresponding to the height of the loops formed on the high portions. The next wire being a knob wire on which low loops are formed it will be seen that upon withdrawal of the knob wire the loops upon passing over the knob at the end of the wire will all be raised to form a row of high loops while at the same time the preceding row of high loops are all reduced to form a row of low loops. When the next special wire is withdrawn and the low loops formed thereon are raised the pile yarns from which these loops are formed will be pulled to reduce the high loops formed from the same yarns in the preceding row of loops. Thus, the loops of the preceding row will be of unequal height.

It is an object of the invention to provide a method of weaving a loop pile fabric having rows of loops of unequal height with intermediate rows of low loops of substantially the same height requiring only one frame of pile warp.

In the accompanying drawing forming a part

2

of this specification and in which like numerals are employed to designate like parts throughout the same.

The figure is an exploded perspective view of a fabric being woven in accordance with my invention.

Referring to the drawing, the special shaped wires 5 and 6 are formed from a flat strip of metal or other suitable material having its upper edge of irregular shape to provide high and low loop forming portions 7 and 8 connected by inclined loop forming portions 9. The length of the high and low loop forming portions may be uniform or vary depending on the design of the fabric to be made. Also the high and low loop forming portions of wires 5 and 6 are formed so the high portions of one wire are opposite the low portions of the other wire when inserted in the fabric being woven. The knob wire 10 has a shank with a straight low loop forming edge 11 of uniform height corresponding to the height of the low loop portions 8 of wires 5 and 6 and at the end of the shank is a raised knob 12 of a height corresponding to that of the high loop portions 7 of the wires 5 and 6. The front or leading edge of the knob is unsharpened and is shaped to allow the loops formed on wire 10 to easily ride up and over the knob when the wire is withdrawn.

In looms for weaving fabrics having loop pile it is customary to insert a series of pile wires in the fabric as it is being woven for a distance of about three inches from the fell or opening of the shed. The number of wires inserted in the fabric before a wire is withdrawn depends on the quality of the fabric to be woven. In my improved method the wires 5, 6 and 10 are inserted in the fabric with a wire 10 intermediate the wires 5 and 6.

In the drawing I have shown a loop pile fabric being woven in accordance with my invention. The backing of the fabric may be of any suitable construction but in the fabric illustrated there are stuffer warps 13 and two series of weft threads 14 and 15, lying, respectively, above and below the stuffer warps and bound in place by crossed binding warps 16 and 17. The single frame of pile warps 18 extend along the fabric in the body thereof between the stuffer warps and upper series of weft threads. When the pile warps 18 are raised a wire is inserted in the shed and then the yarns are looped over the wire by lowering the pile warps to pass under the next upper weft thread. The pile warps raised over wires 5 and 6 will form rows of loops having low

and high loops 19 and 20, with the low loops on wire 5 being opposite the high loops of wire 6. The pile warps raised over wires 10 form rows of low loops 21 corresponding in height to the low loops of wires 5 and 6. When a predetermined number of wires according to the design have been woven into the fabric, the wires are successively withdrawn and re-inserted in the shed formed immediately following the last wire in a series. Upon withdrawal of wire 10 the loops formed thereon will be raised by the knob on the end thereof and upon withdrawal of wires 5 and 6 the low loops formed thereon will be raised by the inclined portions between the low and high portions. Thus, it is seen the withdrawal of all the wires results in the low loops formed thereon being raised to form high loops. However, when the wires are arranged with a knob wire 10 intermediate the shaped wires 5 and 6 and the wires are successively withdrawn it will be seen the row of high loops formed by withdrawal of wire 5 will be reduced to low loops when wire 10 is withdrawn owing to the fact that when the loops on wire 10 are raised by the knob the pile warps are pulled thus reducing the height of the loops formed in a preceding row. Likewise, when wire 6 is withdrawn the raising of the low loops formed thereon will pull the pile warps of the low loops thus reducing only the high loops in the preceding row of loops which are formed from the same pile warps. As the withdrawal of the wires continues in the sequence disclosed the fabric produced will have weftwise rows of loops of unequal or varying heights with intermediate rows of low loops of substantially the same height. While theoretically the intermediate rows of low loops should be the same height, in practice it is found that due to the difference of the tension on the pile warps when pulled some of the loops will be reduced to a slightly lesser extent than others so there is a slight unevenness in the height of the loops.

Having thus described my invention, I claim:

1. The method of weaving on a pile wire loom a pile fabric floor covering having a warp pile face including high and low elements which comprises inserting a pile wire having high and low portions, weaving pile warps over said high and low portions of said wire to form high and low loops, inserting a second pile wire having a straight portion of a height corresponding to the low portions of said first wire and a raised high portion at its end, weaving said pile warps over the straight portion of said second wire, inserting a third wire having high and low portions with the low portions in warpwise alignment with said high portions of said first-mentioned wire weaving said pile warps over said third wire, withdrawing said first wire to form a row of high loops and changing said row of high loops to a row of low loops by withdrawing said second wire and then withdrawing said third wire to raise the low loops thereon and reduce the height of those loops in the preceding row formed of the same pile warps.

2. The method of weaving on a wire loom a pile fabric floor covering having a warp pile face comprising high and low pile loops which comprises inserting a pile wire having high and low portions, weaving pile warps over said high and low portions to form a weftwise row of high and low pile loops corresponding to the high and low portions of said pile wire, inserting a second pile wire having a low straight portion with a high portion at its end, weaving pile warps over

said low straight portion on said second wire to form a succeeding weftwise row of low loops corresponding to the low portion of said second wire, inserting a third pile wire having high and low portions, weaving pile warps over said high and low portions on said third wire to form a succeeding weftwise row of high and low loops corresponding to the high and low portions of said third wire, converting low loops of said first-mentioned weftwise row to high loops by withdrawing said first-mentioned wire, converting the loops of said second-mentioned weftwise row to high loops by withdrawing said second-mentioned wire whereby the loops in said first row are reduced to low loops, and converting high loops of said second mentioned row in pile warps woven over low portions of said third wire to low loops, while maintaining high loops of said second-mentioned row high in pile warps woven over high portions of said third wire, by withdrawing said third pile wire whereby said second row is formed with high and low loops corresponding to the high and low portions of said third pile wire.

3. The method of weaving a pile fabric having a backing and a plurality of pile warps woven in the backing which comprises raising portions of the pile warps to form alternate weftwise rows of loops of varying height and intermediate weftwise rows of loops of uniform height, converting the loops in alternate rows to loops of a uniform height, increasing the height of loops in intermediate rows while reducing the height of loops in a preceding alternate row and converting the loops in intermediate rows to loops of varying height.

4. The method of weaving a pile fabric having a backing and a plurality of pile warps woven in the backing which comprises raising portions of the pile warps to form a series of weftwise rows of loops with alternate rows having loops of varying height and intermediate rows having loops of uniform height, raising the low loops of an alternate row to form a row of high loops, then raising the loops of the following intermediate row to form a row of high loops and reduce the height of the loops in the preceding alternate row, and then reducing the height of those loops in the intermediate row of the same pile warps as the low loops in the next succeeding alternate row when the low loops are raised.

5. The method of weaving a pile fabric having a backing and a plurality of pile warps which comprises forming the backing with the pile warps held therein by the elements of the backing, raising the pile warps from the backing and restoring them to the backing to form weftwise rows of loops projecting above the backing with the loops in alternate rows projecting from the backing at varying heights and the loops in intermediate rows projecting from the backing at a uniform height, raising the low loops of an alternate row to form a row of loops of uniform height, then raising the loops of the succeeding intermediate row to form a row of high loops and reduce the height of the loops in the preceding alternate row, and then raising the low loops of the next succeeding alternate row to form a row of loops of uniform height and reduce the height of the loops in the preceding intermediate row of the same pile warps as the low loops in the alternate row.

6. The method of weaving a pile fabric having a backing and a plurality of pile warps which comprises forming the backing with the pile

5

warps held therein by elements of the backing, raising the pile warps from the backing and restoring them to the backing to form weftwise rows of loops projecting above the backing with the loops in alternate rows raised to varying heights and the loops of intermediate rows raised to a uniform height, successively raising the low loops in alternate rows and all the loops in intermediate rows whereby the loops in alternate rows are converted to loops of uniform height and then reduced in height and the loops in intermediate rows are converted to loops of varying height.

7. The method of weaving on a wire loom a pile fabric having a warp pile face comprising high and low loops which comprises inserting a pile wire having high and low portions, weaving pile warps over the high and low portions to form a weftwise row of high and low loops, inserting a second wire having a straight portion and a high portion at its end weaving pile warps over the straight portion of said second wire to form a weftwise row of loops of uniform height, inserting a third wire having high and low portions, weaving pile warps over said third wire to form a weftwise row of high and low loops, withdrawing said first wire to convert the low loops into high loops, withdrawing said second wire to increase the height of the loops in the second row and reduce the height of the loops in the first row, and withdrawing said third wire to convert the low loops into high loops and reduce the height of those loops of the same warps in the second row.

8. The method of weaving on a wire loom a pile fabric having a warp pile face comprising high and low loops which comprises inserting a pile wire having loop forming portions of varying height, weaving pile warps over said wire, inserting a second wire having a loop forming portion of uniform height and a raised portion at the end, weaving pile warps over said second wire, inserting a third pile wire having loop forming portions of varying height, weaving pile warps over said third wire, withdrawing said first wire to form a row of loops of uniform height, withdrawing said second wire to raise the loops thereon to form a row of high loops and reduce the height of the loops in said first row and withdrawing said third wire to form a row of loops of uniform height and reduce the height of those loops of the second row of the same pile warps as the loops in the third row raised by withdrawal of the third wire.

9. The method of weaving on a wire loom a pile fabric having a warp pile face comprising high and low loops which comprises inserting a pile wire having a high loop forming portion, weaving pile warps over said wire, inserting a second wire having a raised portion at the end, weaving pile warps over said second wire, insert-

6

ing a third wire having a high and low loop forming portions, weaving pile warps over said third wire, withdrawing said first wire to form a row of high loops, withdrawing said second wire to form a row of high loops and reduce the height of the loops in the first row and then withdrawing said third wire to form a row of high loops and reduce the height of those loops in the second row of the same pile warps woven over the low portions of the third wire.

10. The method of weaving on a wire loom a pile fabric having a warp pile face comprising high and low loops which comprises inserting a pile wire having low, inclined and high loop forming portions, weaving pile warps over said wire to form a row of loops of graduated height, inserting a second wire having a high portion at the end, weaving pile warps over said second wire to form a row of loops of uniform height, inserting a third wire having low, inclined and high loop forming portions, weaving pile warps over said third wire to form a row of loops of graduated height, withdrawing said first wire to form a row of high loops, withdrawing said second wire to increase the height of the loops in the second row and reduce the height of the loops in the first row and withdrawing the third wire to convert the lower loops in the third row to a uniform height and reduce the height of those loops in the second row of the same pile warps as the lower loops in the third row.

11. The method of weaving on a wire loom a pile fabric having a warp pile face comprising high and low loops which comprises inserting a series of wires having high and low loop forming portions in alternation with wires having a straight loop forming portion and a loop raising portion at the end, weaving pile warps over said wires to form alternate weftwise rows of high and low loops and intermediate rows of loops of uniform height, and successively withdrawing said wires to raise the low loops of alternate rows to high loops and increase the height of loops in intermediate rows to reduce the height of the loops in alternate rows, the loops in intermediate rows of the same pile warps as the low loops of the succeeding alternate row being reduced in height upon raising of the low loops.

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