Nov. 11, 1947. E. J. DACEY 2,430,559

PILE FABRIC

Filed Nov. 30, 1945 2 Sheets-Sheet 1

Fig. 1

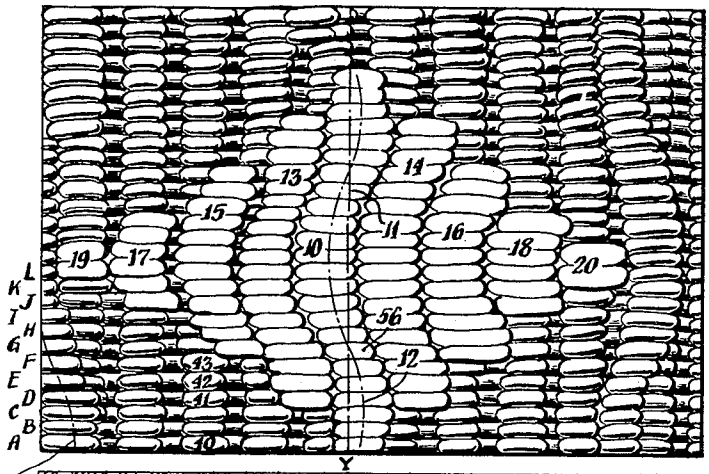


Fig. 2

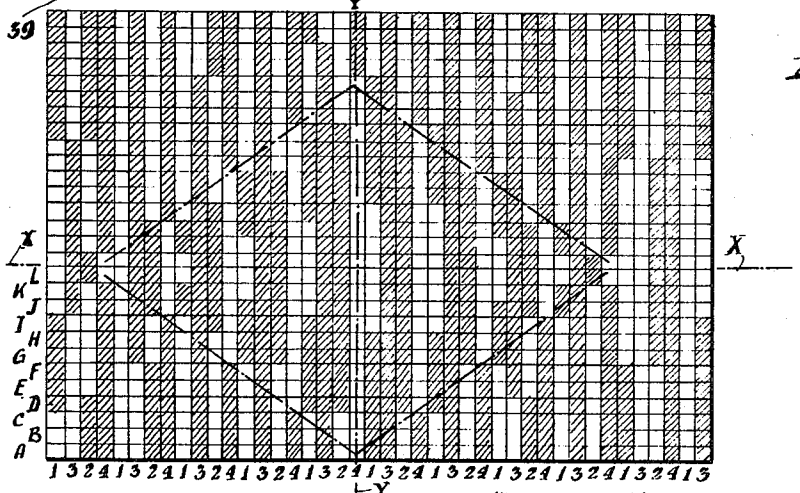
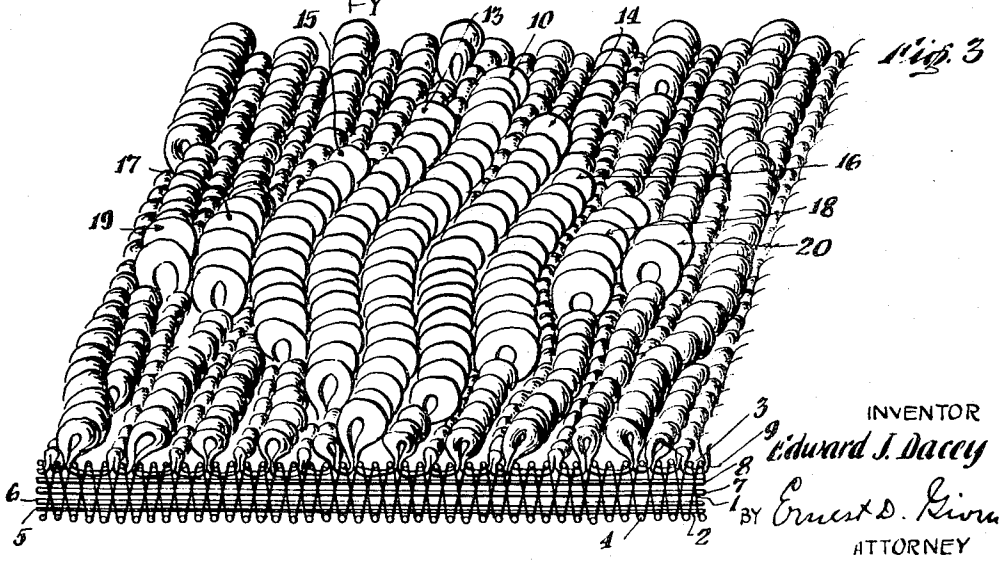


Fig. 3



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PILE FABRIC

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Fig. 4

Fig. 5

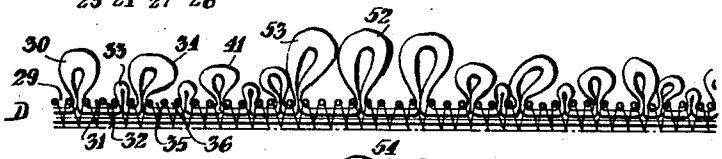

Fig. 6

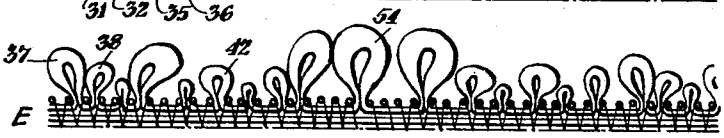

Fig. 7

Fig. 8

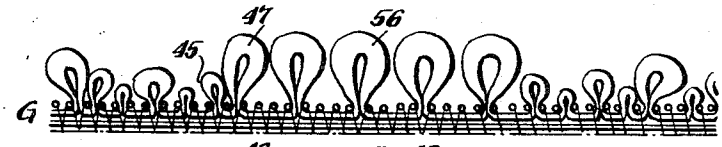

Fig. 9

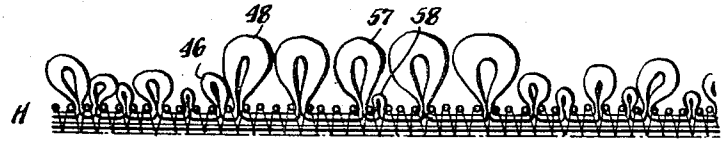

Fig. 10

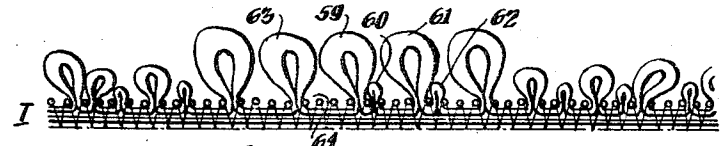

Fig. 11

Fig. 12

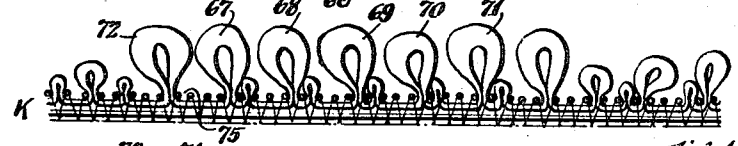

Fig. 13

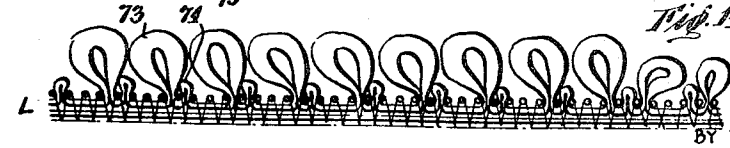

Fig. 14

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UNITED STATES PATENT OFFICE

2,430,559

PILE FABRIC

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Application November 30, 1945, Serial No. 632,000

13 Claims. (Cl. 139—403)

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This invention relates to new and useful improvements in pile fabrics such as rugs and carpets.

Among the objects of the invention is to provide a pile fabric with ground and figures respectively constructed from pile of different heights interrelated in such manner as to provide distinctive and unique texture effects due to the different heights of pile, the quantity of yarn which forms different individual pile, and various arrangements of discontinuous rows of pile of one or another height.

Another object of the invention is to provide a pile fabric wherein pile or tufts of different heights are selectively located to form figures and ground and some of the pile or tufts are selectively influenced to lean in one or another direction warpwise of the fabric to provide curvilinear effects in different rows of pile fastened to the fabric between straight rows of weft shots, whereby unique designs with a variety of curvilinear and linear rows of pile are produced in either the figures or the ground or in both the figures and ground.

Another object of the invention is to produce a pile fabric having certain selected pile yarns raised above ground pile and definitely producing elevated design areas within which the higher pile is variously inclined from the root of the pile so that pile in rows of pile which are attached in straight rows weftwise of the fabric are inclined at various angles from the vertical in the warpwise direction of the fabric and curvilinear effects are produced in the elevated designs.

Another object of the invention is to provide a method for making a pile fabric wherein pile of different heights are arrangeable to form figures in relief rising from the ground of the fabric and merging therewith in a hill-and-dale manner. The relief may have a limitless variety of forms with higher pile thereof constituting the visible aspects of the relief while some of the lower pile remain hidden but contribute to influence the form of the relief portion of the fabric by giving lateral support to the higher pile on one side or the other, while other of the lower pile is visible in lower portions of the relief and is a part of the structure of the ground about the more elevated relief portions of the fabric.

Another object of the invention is to provide pile fabric wherein pile is formed by looping warp yarn ends over a series of straight wires of varying heights to form rows of pile of varying heights confined at their bases in straight lines between adjacent weft shots, and the wires are

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so arranged and warp yarn ends are so selected as to cause relocation of the tops of the higher pile out of alignment with their bases by the omission of pile at one side of high pile and the application of support against their opposite side which is provided by the presence of adjacent pile of the same or lower height. The relocation of the tops of the higher pile may effect, as desired, a curvilinear appearance in the surface of a finished pile fabric, as observed from above, notwithstanding that all of the pile-forming wires which are used in fabricating the fabric and forming the pile are straight. The ornamentation thereby produced results in permanent texture throughout the fabric which is retained even though the fabric and the pile is subjected to pressure during use. The lower pile supports the higher pile and causes restoration of the higher pile after crushing. A further and important achievement of the invention is the saving in warp yarn that can be accomplished without leaving any portion of the carcass of the fabric uncovered.

The principle of the invention is capable of utilization for the making of Wilton carpet fabrics, velvet carpet fabrics, plush and velvet upholstery fabrics and Brussels carpets. The pile or tufts may be cut or uncut throughout the fabric or may be selectively cut or uncut in a single fabric to provide contrasting areas of pile, depending upon which of the pile wires have cutter blades.

The process employs straight pile wires of different heights or widths and effects the control of the placing of yarn thereover for producing piles of different heights, and also the omission of pile between weft shots. The fabric can be made on a standard loom which is prepared by the insertion of pile wires which are selected and arranged in such sequence as is required to produce a desired arrangement of high and low pile in the finished fabric.

The selection of the warp yarn ends for forming pile or for running warp yarn ends in the back or base of the fabric is predetermined by the Jacquard cards upon which the desired pattern has been placed. By reason of the control effected by the cards and the arrangement of the various wires in the wire box of the loom, the warp yarn ends are selected to locate and to produce pile of different heights and also to omit pile between selected weft shots. The number of different heights of wires is variable according to choice to provide whatever undulating or other effect is desired to be obtained by the pile or the

fabric. The pile may be of three, four, five or more heights, according to choice, with the wires arranged in a variety of sequential combinations, giving regular or irregular effects, as desired. For explaining the principle of the invention, I have selected for illustration a fabric which was produced by the use of pile wires of four different heights. I wish it to be understood, however, that the utility of the invention is not limited to any particular pattern, figure, texture or the choice of colors of the various warp yarns when color effects are desired.

Referring to the drawings,

Fig. 1 shows a top view of a pile fabric embodying my invention;

Fig. 2 is a card-cutting guide for producing the design of the pile fabric illustrated in Fig. 1;

Fig. 3 is an isometric view of the pile fabric illustrated in Fig. 1;

Fig. 4 is a sectional view of pile wires as arranged for looping yarn to form pile of different heights to produce the fabric illustrated. In this view the warp yarn end in course A is shown looped over certain of the wires;

Fig. 5 is a section warpwise of the fabric illustrating the pile in dents or courses A, B and C of the pile fabric illustrated in Fig. 1; and

Figs. 6, 7, 8, 9, 10, 11, 12, 13 and 14 show, respectively, warpwise sections in dents or courses D, E, F, G, H I, J, K and L of the pile fabric illustrated in Fig. 1.

The carcass or back of the pile fabric is of conventional type. As shown in the warpwise section illustrated in Fig. 3, the carcass includes two chain or binder warps 1, 2, interlacing alternately after passing over and under the top and bottom shots of filling 3 and 4, respectively. The usual stuffer threads 5, 6, and warp yarn ends 7, 8 and 9 are located between the upper and lower weft shots, as is common in a Wilton-type of pile fabric. The warp yarn ends which are not selected to form a tuft or pile on the face of the fabric remain in the back of the fabric. For the purpose of illustrating the invention, I have shown one warp yarn in each course looped over the pile wires for forming all of the pile in one course of the fabric, but it will be understood that when designs employing different colors are desired, colored warp yarns are selectively looped as desired over the pile wires or floated in the back of the fabric in accordance with a predetermined pattern of selection. Consequently, there may be a number of warp yarn ends in each course or dent. I have illustrated several warp yarn ends, although for the purpose of understanding my invention it will suffice to describe a pile fabric wherein only one of the warp yarn ends enters into forming pile.

The fabric illustrated in Figs. 1 and 3 has a diamond-shaped elevated design area which is formed from nine rows of yarn which has been selectively looped over high wires. These rows run weftwise of the fabric and vary in number of pile, the first row having two pile, the second row having six pile, the third row having 12 pile, the fourth row having 18 pile, the fifth or middle row having 24 pile, the sixth row having 18 pile, the seventh row having 12 pile, the eighth row having six pile, and the ninth row having two pile. All of these high looped pile are visible but the same elevated design area includes a number of low pile which are not visible from above but nevertheless enter into forming the configurations which the lines of high pile have, as will be explained hereinafter.

The area of the fabric immediately surrounding the diamond-shaped elevated area is made up in the present example of fabric of rows of pile of three different heights, the highest of which is of less height than the highest pile in the elevated design area. The rows of pile runing weftwise of the fabric may be straight or curved, as desired, and the amount of curvature is variable, depending upon the placement and height of adjacent pile in the same course and the presence or absence of voids in the face of the fabric. It will be appreciated that by selectively raising pile of different heights the amount of curvature in any one row of pile weftwise of the fabric may be varied to produce different textures.

For producing texture in both the elevated design and in the ground of the fabric illustrated in Fig. 1, the pile wires are assembled in the wire box of the loom in a given sequence, but other textures may be effected by a different sequence and by the use of a different number of wires of different heights. The sequence of the wires by which the fabric illustrated in the drawings is produced is indicated in Fig. 2 by the numerals 1, 3, 2, 4; 1, 3, 2, 4, etc., starting from the left edge of the card-cutting guide. The values of these numerals designate the relative heights of the wires, and their relationship indicates the sequence of the wires assembled in the wire box of the loom. The numerals indicating the relative heights of the wires are herein designated for convenience, as follows: the low wire, one-high; the second highest wire, two-high; the third highest wire, three-high; and the fourth highest wire, four-high. The relationship of these wires is illustrated in Fig. 4. With four heights of wires being employed a wire box containing 28 wires would have a series of four wires repeated seven times.

The function of the Jacquard card is to raise and leave unraised certain yarn ends to produce pile in the surface of the fabric in the usual manner of operation of Jacquard mechanism, but the selection of the yarn ends is predetermined and set into the design of the card to obtain the novel pile fabric of the present invention. This involves the location of pile of low height with respect to pile of higher height in adjacent rows and the selective forming of voids. By selectively raising the warp yarn ends in different rows crosswise or weftwise of the fabric, the high pile in any one row can be variously inclined warpwise and it can be differentially inclined to provide a varying curvature in the respective rows of high pile. This may be understood by viewing the central row 10 of the high pile in the elevated design of Fig. 1. The root line of this row of pile is straight, as indicated by the straight line 11, whereas, the center line 12 which passes through the center of the tops of the row of pile is sinusoidal. The immediately adjacent rows 13 and 14 of high pile are similarly curved but are of shorter length. The same is true of the pairs of rows 15, 16 and 17, 18 with each pair of rows being of less length as the design of the diamond approaches the apices at either side. The two pile 19 at the left apex and the two pile 20 at the right apex of the elevated design are inclined equally to the left.

The approximate inclination of any particular pile or tuft in each of the courses A to L, inclusive, is schematically illustrated in Figs. 5 to 14, inclusive. The first three courses are identical and are illustrated in Fig. 5, each having a first pile 21 one-high in the first row, a three-high pile 22 in the second row and the warp yarn

floating at 23 and 24 in the back of the fabric in the third and fourth row. The next two pile wires form a one-high pile 25 and a three-high pile 26, but the yarn was left unraised in rows 27 and 28. The effect of having pile 21 and 25 immediately to the left of the higher pile 22 and 26, respectively, and omission of pile in the two rows immediately to the right of the higher pile 22 and 26 is to cause the higer pile 22 and 26 to incline to the right or in the direction of least support. The warp yarn of the pile illustrated in Fig. 5 is shown as looped over pile wires in Fig. 4. When this is done in the loom the yarn is under tension, but when the wires are withdrawn the pile yarn opens up somewhat as illustrated in Fig. 5 except where bound at the root.

In the fourth dent which is identified as D and illustrated in Fig. 6 there is no pile raised between the first pair of weft shots and therefore there is an omission of pile at 29. The pile is raised in the second row over the three-high wire and forms a three-high pile 30. In the third and fourth rows 31 and 32 the yarn is floated in the back of the fabric, but in the fifth row the yarn is raised over the one-high wire to form a pile 33. A three-high pile 34 is formed in the sixth row but the yarn end is floated in the back of the fabric in rows 35 and 36. It will be seen that by comparing the pile structure in Figs. 5 and 6, the three-high pile in the second row is inclined differently in the two courses, the pile 22 in courses A, B and C being inclined to the right, and the pile 30 in course D being equally unsupported on both sides and having the tendency to remain erect or vertical.

In course E, as illustrated in Fig. 7, pile 37 in the second row of the fabric is given support on its right side by a two-high pile 38, with the result that pile 37 tends to incline toward the left. Inclination of pile 37 to the left is greater than the inclination of pile 22 to the right because the immediately adjacent pile 38 is higher than the immediately adjacent pile 21 and therefore provides greater support than the lower pile.

It will be appreciated from the description thus far set forth that the second row of pile from the left will be given a curving appearance when viewed from above (Figs. 1 and 3) because of the inclination of the pile to the right in the first two courses A, B and C and the inclination of the pile to the left in courses E, F, G, H and I. This produces a curving effect as illustrated in Fig. 1 by the dotted line 39.

The pile just described is located in the area of the fabric which is designated as the ground area. In this area the highest pile is of less height than the highest pile in the elevated area and because of this there will be more of the lower pile showing in the ground area. In other words, the ground area is constituted of pile of three different heights with a large proportion of the shorter or one-high pile showing in the surface of the ground. It will be appreciated that the amount of curvature or the lack of curvature or the presence of lineal texture in the ground can be variously effected, depending upon the location of the pile of different height in adjacent rows weftwise of the fabric and the number of pile and omissions of pile in the various rows. For example, the warp yarn ends in the first six courses starting from the bottom of Fig. 1 are raised over a two-high wire in the eleventh weftwise row from the left, as illustrated in Figs. 4 to 8, inclusive, and on either side of this row of six pile there are omissions of yarn between adjacent pairs of weft shots and no pile coming in contact with the two-high pile so that the two-high pile remain substantially vertical. These two-high pile are identified as 40, 41, 42 and 43 in Figs. 1, 4, 5, 6, 7 and 8 and it will be seen by examining these figures that the row of pile weftwise of the fabric is lineal.

In courses G and H pile 45 and 46, Figs. 9 and 10, are looped over the same two-high wire but are inclined slightly to the left because of their contacting proximity with the immediately adjacent four-high pile 47 and 48, respectively. It therefore follows that a row of pile emanating from a straight root can be given the appearance of lying in a straight line or in a curved line, as viewed from above, and that a single row of pile may be made to appear curved or straight, depending upon the presence and absence of pile in adjacent rows.

As an example showing the manner in which a reverse curve effect can be produced in a single row of pile weftwise of the fabric, reference may be had to the central row 10 of the pile contained in the diamond-shaped design located centrally of Fig. 1. In the first three courses, A, B and C, Fig. 5, the four-high pile 50, Fig. 5, is biased to the right because of the strong support given by the two-high pile 51 at its left side. In the same row but in course D, Fig. 6, pile 52 is influenced to the right but to a lesser degree than pile 50. This is because pile 53 provides less pressure on the left side of pile 52 than is provided by pile 51 on the left side of pile 50. In the next two courses, Figs. 7 and 8, pile 54 and pile 55 have substantially the same amount of influence to the right as pile 52 in course D. In course G, Fig. 9, pile 56 is substantially vertical because the next two piles to the left and right are equispaced and exert substantially the same pressure on either side of pile 56. In course H, Fig. 10, pile 57 is inclined slightly to the left because of the presence of a one-high pile 58 immediately adjacent its right side. In course I, Fig. 11, pile 59 has a greater inclination to the left because of the presence of the one-high pile 60 at its right side and the leftward inclination of pile 61 which is brought about by the presence of a one-high pile 62 at its immediate right side. Pile 63 is also influenced to the left because of its proximity to pile 59, but less so than pile 59 because of the absence of pile in row 64 which, if present, would apply lateral pressure against pile 63 in the manner in which lateral pressure is applied against pile 59 by pile 60. In course J, Fig. 12, pile 65 which is in the same row of pile as pile 63, has immediately adjacent its right side a one-high pile 66, with the result that pile 65 has more force applied against its right side than pile 63 has. Consequently, pile 65 is inclined to the left a greater degree than pile 63. In course K, Fig. 13, each of piles 67, 68, 69, 70 and 71 has a lower pile in the row immediately adjacent its right side, so that all of these five pile are more strongly urged to incline to the left than the five pile in the same rows in course J, Fig. 12. The influence to incline to the left of all of the high pile in course L, Fig. 14, is a little greater because each of these nine four-high pile has a lower pile immediately to its right which tends to support the pile at their right side. This may be appreciated by comparing pile 72 in course K, Fig. 13, and pile 73 in course L, Fig. 14, the latter being partially supported at its right side by a low pile 74 and the former pile 72 tending to remain a little more

upright because of the absence of low pile in row 75 and its natural tendency to remain upright except for the opposition provided by pile 67 in the same course. Consequently, pile 72 extends at an angle to the vertical of lesser degree than the angle which pile 73 makes to the vertical. The effect of this construction may be more full appreciated by viewing Fig. 1 which shows that all of the four-high pile in course L is a little more displaced to the left than all of the four-high pile in course K. This principle of influencing the pile in different courses to incline in one or another direction warpwise of the fabric in varying degrees in different courses can be employed throughout the elevated design and throughout the ground, or in portions of the elevated design and portions of the ground, as desired. By varying the locations of the pile in the surface of the fabric, different curvatures may be produced with resulting varieties of texture.

By inspecting Fig. 1 it will be observed that pile 56 in course G lies centrally with respect to the straight line 11 which delineates the center of the root of the weftwise row of pile, and that the pile in the same row in courses H, I, J, K and L are inclined differentially towards the left, whereas, the pile in the same row in courses A, B, C, D and F are likewise inclined, but to the right.

The visible aspects of the diamond design are produced by the four-high pile within the diamond area, and consequently this area is elevated above the surrounding ground. Within this area the low pile, such as the one-high pile 58, 60, 62, 66 and 74 normally are invisible from above, but their presence is required in order to produce the curvilinear effects just described.

In Fig. 2 I have shown a diagram of the design shown in Figs. 1 and 3, such as is used for the card cutter's guidance in transferring a design onto Jacquard cards by which the yarn ends are controlled for producing the design. The vertical rows are marked to correspond with the arrangement of the pile wires previously set into the wire box of the loom, which arrangement in the present case, is 1, 3, 2, 4; 1, 3, 2, 4, etc. The yarn ends in the several courses or dents are marked along the vertical edge of the card-cutting guide by letters A to L, inclusive. Since the elevated design is symmetrical on a longitudinal axis, X—X, the Jacquard pattern above the axis X—X will correspond with pattern below the axis but in descending series, that is L to A, inclusive, within the elevated design area. The clear areas correspond to the location of pile and the blackened areas correspond to absence of pile. The vertical axis Y—Y corresponds to the straight row of pile roots indicated by line 11 in Fig. 1. It is to be understood that symmetry of design is not essential and that the fabric can be characterized by irregularity of pattern. This can be understood by studying the ground area outside of the diamond marked on Fig. 2, wherein it appears that all of the weftwise rows of pile are not symmetrical about axis X—X. By comparing the diagram with the illustrated designs of the fabric, it will be immediately apparent how the particular card selects the warp yarn ends in the various dents to loop the yarn ends over the several wires or to leave the yarn ends floating in the back of the fabric to provide omissions of yarn as each row of the fabric is constructed. As a consequence of forming the pile of the fabric just described at no time is any one of the pile wires fully covered with warp yarn ends, yet no part of the carcass or back of the fabric can be seen when the pile is normally disposed as when the fabric is in use.

The yarn ends which are selected to form pile are tightly held at their bases by pairs of weft shots. Since the piles are of different heights the yarn in the higher piles will tend to assume relatively larger diameters than the yarn in the shorter piles when the pile-forming wires are withdrawn. These differences in the diameters of the yarns of the several pile are somewhat exaggerated in the drawings for the purpose of illustrating the relative differences and the effects which the various pile have in producing different texture in different parts of the over-all pattern of a rug. The higher pile tends to diffuse laterally more than the shorter pile.

In the pile fabric which has been selected for the purpose of explaining the principle of the invention, pile wires of four different heights are used for producing pile of four different heights, but it is to be understood that a more or less number of wires may be employed and that their arrangement with respect to each other may vary for producing different pile fabrics. The utility of the invention is not limited to any particular pattern, figure, texture, or to choice of colors of the various warp yarns when color effects are desired. In the rug illustrated the high lights and shadows are different as the rug is viewed from the left or from the right and this effect is variable according to the selection of pile wires and their sequence.

What is claimed is:

1. A pile fabric comprising, in combination, stuffer warps, weft shots lying above and below the stuffer warps, binder warps crossing the weft shots above and below and binding the weft shots in place, and a plurality of courses of pile warps held in place by portions lying between the upper and lower weft shots, said pile warps having other portions raised between adjacent upper weft shots in accordance with a pattern to provide loops forming pile of different heights, certain of the highest pile being supported on one side by lower pile whereby in a given area of pile the highest pile are selectively influenced to lean warpwise of the fabric to provide curvilinear effects in different rows of pile fastened to the back of the fabric between straight rows of weft shots.

2. A pile fabric, comprising in combination, stuffer warps, weft shots lying above and below the stuffer warps, binder warps crossing the weft shots above and below and binding the weft shots in place, a plurality of courses of pile warps held in place by portions lying between the upper and lower weft shots, said pile warps having other portions raised between adjacent weft shots, and providing a ground pile area and a design area, said ground pile area having pile formed by looping warp yarn ends over wires of different heights, and said design area formed by looping some of the warp yarn ends over wires of greater height than any wires used in forming the pile in said ground area and over wires lower than the highest wire whereby support is contributed to the higher pile and the design area is maintained in relief with respect to the ground area.

3. A pile fabric, comprising in combination, stuffer warps, weft shots lying above and below the stuffer warps, binder warps crossing the weft shots above and below and binding the weft shots in place, a plurality of courses of pile warps held

in place by portions lying between the upper and lower weft shots, said pile warps having other portions raised between adjacent upper weft shots, and providing a ground pile area and a design pile area, said ground pile area having pile formed by looping warp yarn ends over wires of different heights, and said design area formed by looping some of the warp yarn ends over wires of greater height than any wires used in forming the pile in said ground area and over lower wires in selected positions adjacent the higher pile to influence the higher pile in curvilinear rows in the upper surface of the pile.

4. A pile fabric comprising, in combination, stuffer warps, weft shots lying above and below the stuffer warps, binder warps crossing the weft shots above and below and binding the weft shots in place, and a plurality of courses of pile warps held in place by portions lying between the upper and lower weft shots, said pile warps having other portions raised between adjacent upper weft shots and forming a ground pile area and a design pile area, the pile in said ground pile area and in said design pile area being formed by pile warps looped over wires of four different heights with no pile warps looped over the highest of said four wires within the ground pile area, and the highest pile wire used in forming pile within said ground pile area has no pile warp looped over it in the design pile area, whereby at no time is any one of the pile wires fully covered with pile warps.

5. A pile fabric comprising, in combination, stuffer warps, weft shots lying above and below the stuffer warps, binder warps crossing the weft shots above and below and binding the weft shots in place, and a plurality of courses of pile warps held in place by portions lying between the upper and lower weft shots, said pile warps having other portions raised between adjacent upper weft shots in accordance with a pattern to provide loops forming pile of different heights, said pattern including a ground area composed of piles of different heights between selected weft shots and relief areas composed of pile looped to a greater height than any other pile in the ground area and pile of low height selectively located adjacent the high pile of the relief areas, whereby the high pile in the relief areas is influenced by the low pile to lean and provide curvilinear effects in the surfaces of the relief areas.

6. A pile fabric structure comprising a base fabric of woven warp and weft yarns and warp pile yarns woven into the base fabric, said warp pile yarns forming a ground area and a design area in relief with respect to the ground area, said ground area comprising pile having different heights, and said design area in relief also comprising pile having different heights of which the higher pile is of greater height than the highest pile in the ground area, and the lowest pile is of substantially the same height as the lowest pile in the ground area, the fabric within the design area in relief having absences of pile adjacent one side of some of the rows of higher pile, whereby the higher pile is displaced laterally from their roots by the lower pile.

7. A pile fabric structure comprising a carcass having woven warp and weft yarns and warp pile yarns woven into the carcass, said pile yarns being selectively raised warpwise of the fabric to at least three different heights and forming weftwise rows of pile with all of the pile in any weftwise row being of the same height and with successive pile in any warpwise row of pile being of different heights, voids interspersed over the face

of the carcass by the selective omission of pile warpwise of the fabric, whereby at least some of the higher pile which are located adjacent voids are influenced to lean towards the voids by pile which are located within another weftwise row of pile at the other side of said higher pile.

8. A pile fabric structure comprising a carcass having woven warp and weft yarns and warp pile yarns woven into the carcass, said warp pile yarns having portions forming pile of different heights between rows of weft yarns, with the pile in some of the rows of pile being of lower height than the pile in an immediately adjacent row of pile with the low pile exerting side pressure on the high pile, and voids of varying expanse warpwise of the fabric due to the absence of pile between successive weft yarns, said voids being selectively interspersed in the surface of the fabric alongside both high pile and low pile, whereby the pile in some of the rows of pile extending weftwise of the fabric is influenced to lean warpwise towards adjacent voids by lower pile and thereby provide pattern effects in the surface of the fabric occasioned by departure of such influenced pile from straight lines running weftwise of the fabric.

9. A pile fabric structure comprising a carcass having woven warp and weft yarns and warp pile yarns woven into the carcass, said warp pile yarns having portions forming pile in rows between weft yarns with the pile in contiguous rows differing in height, certain of said rows of pile being flanked on one side by absence of pile emanating from between adjacent rows of weft yarns and on the other side by lower pile whereby the higher pile is biased towards its relatively undersupported side, the presence and absence of lower pile with respect to higher pile being occasionally reversed in individual rows weftwise of the fabric whereby the higher pile in a given area are influenced to lean warpwise to the left and to the right along different portions of a row of higher pile.

10. A pile fabric structure comprising a carcass having woven warp and weft yarns and warp pile yarns woven into the carcass, said warp pile yarns being raised to form pile in rows crosswise of the fabric between adjacent weft yarns with the warp pile yarn occasionally floating in the carcass to provide interruptions of varying lengths in the continuity of crosswise rows of pile, the pile in contiguous rows of pile being of different heights whereby the pile is vertically undulated in the warpwise direction of the fabric and some of the pile is displaced horizontally from the vertical planes of their root lines and produce flexuous rows of pile crosswise of the fabric.

11. A pile fabric comprising a carcass having woven warp and weft yarns and warp pile yarns woven into the carcass, said warp pile yarns having portions forming pile of different heights with the pile in contiguous rows of pile differing in height within a given area and with pile omitted in sequences of courses which are selectively displaced from one another in different rows crosswise of the fabric and provide interruptions in the continuity of each row of pile whereby the pile in different rows are separated into groups which are displaced from one another crosswise of the fabric with the result that pile in one row and opposite the interruptions of pile in a contiguous row tend to incline towards the interruptions in the contiguous row and the pile appears in broken and irregular rows departing from the

vertical planes of the weft yarns between which they are held.

12. A pile fabric structure comprising a carcass having woven warp and weft yarns and warp pile yarns woven into the carcass, said warp pile yarns having portions forming pile of at least three different heights arranged in successive rows extending crosswise of the fabric with the pile in contiguous rows of pile differing in height within a given area and with occasional omission of pile for forming discontinuous rows of pile crosswise of the fabric of one or another height whereby the higher pile is variously inclined from their roots in a warpwise direction depending on the amount of support provided by pile in adjacent rows of pile at one side thereof and lack of substantial support due to the absence of pile on the other side.

13. A pile fabric structure comprising a carcass having woven warp and weft yarns and warp pile yarns woven into the carcass, said warp pile yarns having portions forming pile in rows running weftwise of the fabric with successive rows of pile differing in height and arranged in order,

1-high, 3-high, 2-high and 4-high, relatively speaking, with occasional omissions of pile selectively located in the several rows whereby the higher pile is variously influenced by other pile to lean from their roots in a warpwise direction and substantially all of the face of the carcass is covered by erect or leaning pile.

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