

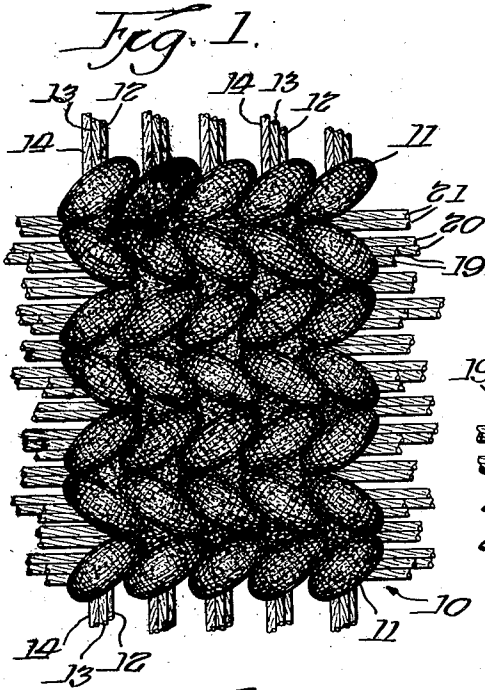
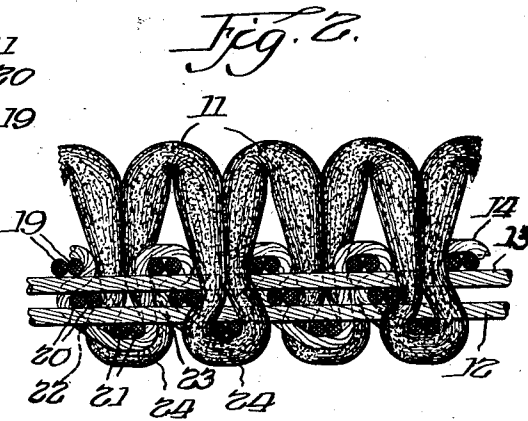
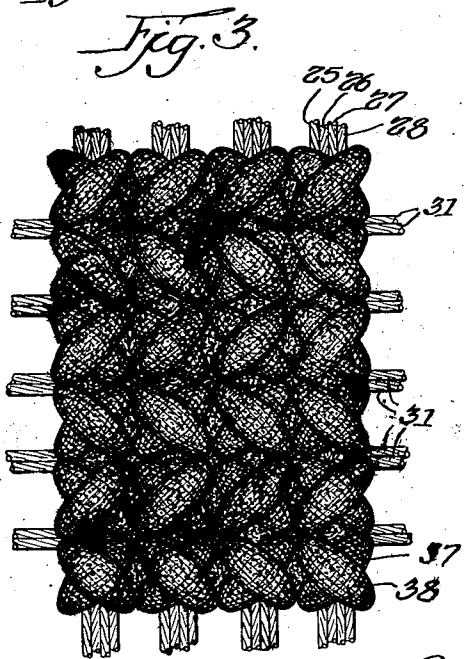
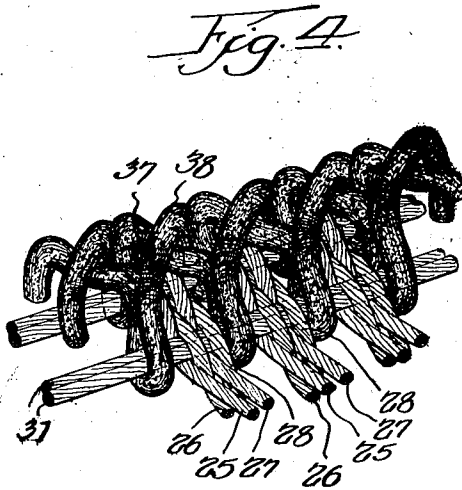
Oct. 20, 1953

E. F. CLARK
LOOP PILE FABRIC

2,655,951

Filed March 6, 1948

4 Sheets-Sheet 1



Inventor.
Eugene F. Clark.
By Wilkinson Huxley Pym & Hume
Atty's

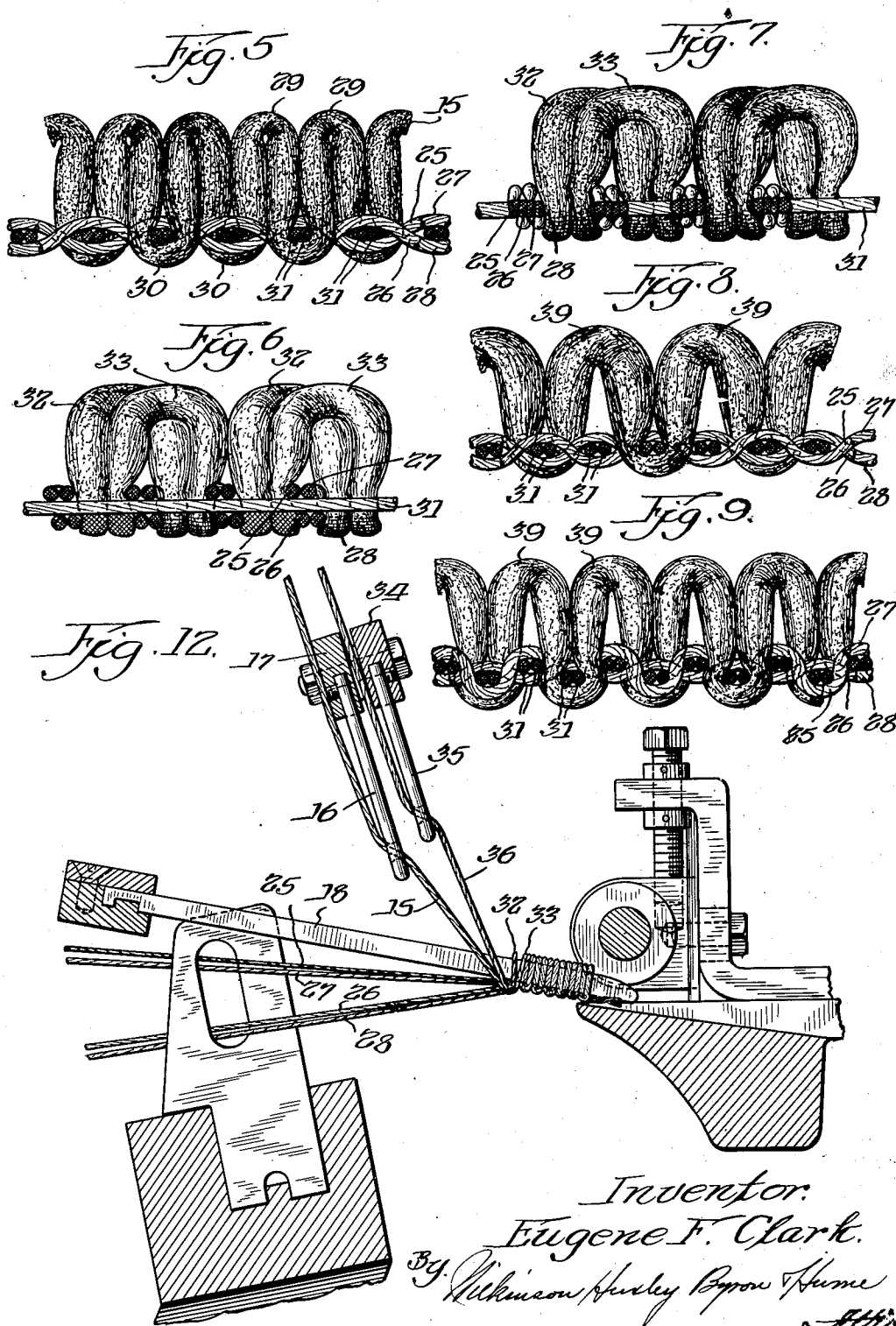
Oct. 20, 1953

E. F. CLARK
LOOP PILE FABRIC

2,655,951

Filed March 6, 1948

4 Sheets-Sheet 2



Inventor.
Eugene F. Clark.
By *Wilkinson/Hurley Byron Hume*
Attys

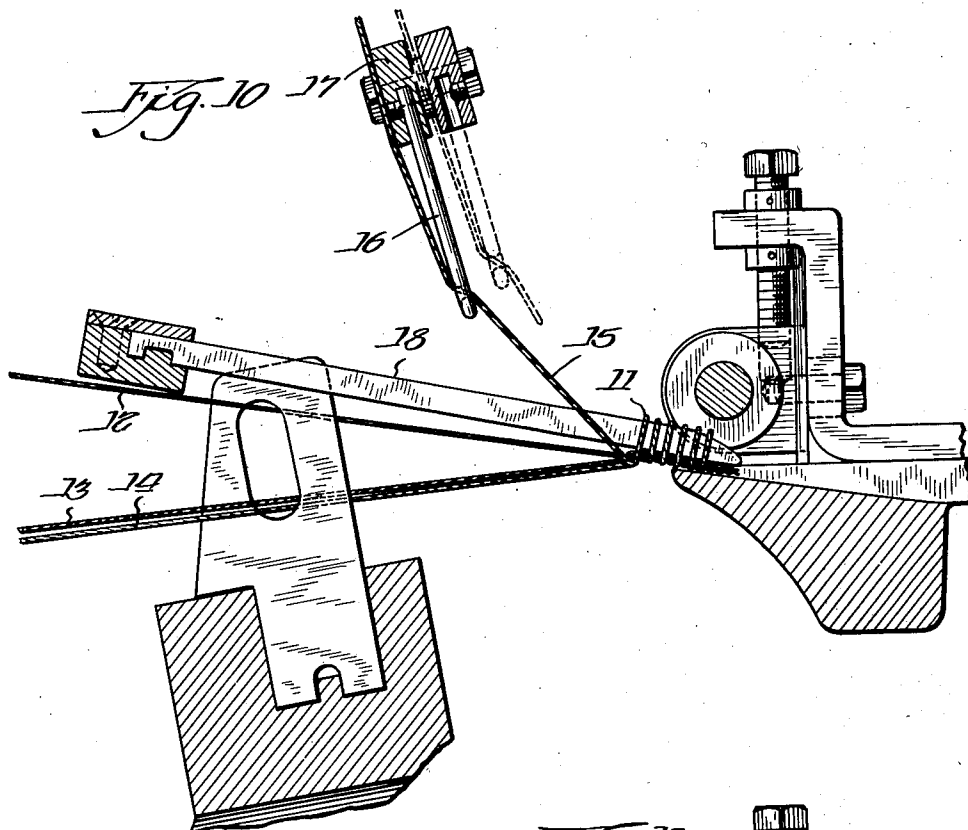
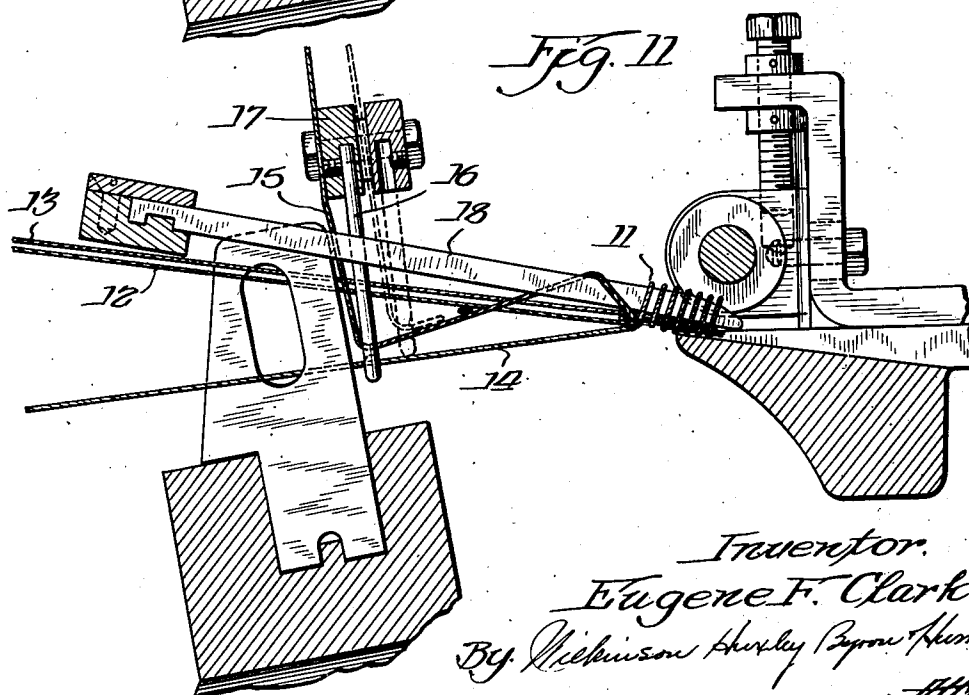
Oct. 20, 1953

E. F. CLARK
LOOP PILE FABRIC

2,655,951

Filed March 6, 1948

4 Sheets-Sheet 3



Inventor.
Eugene F. Clark.
By. Wilkinson Hurley Bryan Home
Atty.

Oct. 20, 1953

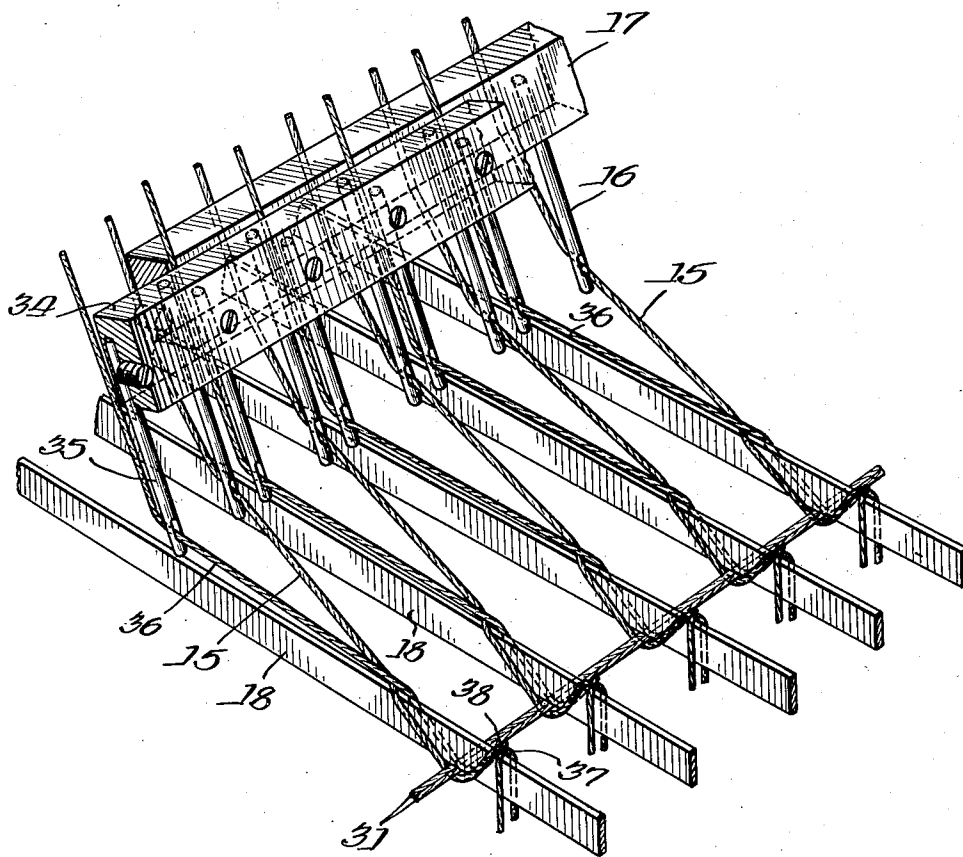
E. F. CLARK
LOOP PILE FABRIC

2,655,951

Filed March 6, 1948

4 Sheets-Sheet 4

Fig. 13.



Inventor.
Eugene F. Clark.
By *Nicholson Hurley Byrne & Neme*
Attys.

UNITED STATES PATENT OFFICE

2,655,951

LOOP PILE FABRIC

Eugene F. Clark, Damariscotta, Maine, assignor
to Marshall Field & Company, Chicago, Ill., a
corporation of Illinois

Application March 6, 1948, Serial No. 13,371

4 Claims. (Cl. 139-403)

1

My invention relates to loop pile fabrics of the type generally used for rugs or carpets and has particular reference to a fabric having a base woven of the usual warp and filler yarns and a pile interwoven therewith, usually of a soft wool yarn, in the form of loops on one side of the base fabric, the strands of pile yarn being continuous in a warpwise direction in looped form around the filler yarns and in looped form constituting the pile, and is a continuation in part of my co-pending applications Serial Nos. 566,853 filed December 6, 1944, now Patent No. 2,437,378, 660,573 filed April 3, 1946, now Patent No. 2,437,379, and 746,227 filed May 6, 1947, now Patent No. 2,578,173.

Another and further object of my invention is the provision of a pile fabric for use as a carpet or rug in which a plurality of closed loops are provided on the wearing surface of the fabric which loops are in self-retained relation therein without the necessity of adding any additional material such as cement as a backing whereby the loops are held in substantial placement for ordinary use and purpose with the beat-up operations being sufficient to form a snug base from which the pile tufts cannot be easily displaced.

Another and further object of my invention is the provision of a carpet or rug fabric in which strands of pile yarn are looped into the base fabric around the strands of filler yarn on opposite sides of selected groups of warp threads in such fashion that a pile surface is produced of a plurality of loops the displacement of which means that the strand of pile yarn must be moved or drawn through the fabric which because of the tightness with which the fabric is woven together is not easy of accomplishment.

Another and further object of my invention is the provision of a pile fabric having a looped pile which is compact at the base of the loops forming the pile adjacent the base fabric and through the use of closed loops the interstices between certain of the strands of yarn are closed thereby preventing dirt from lodging between the tufts and presenting a tight surface pleasant and elastic when under foot and possessing excellent wearing qualities in service.

Another and further object of my invention is the provision of a pile fabric having pile formed of continuous strands of yarn looped into the base fabric and in the form of loops on one side of the base fabric in which air is trapped to a certain extent, thereby forming a long lived and elastic fabric which in effect forms an elastic mat as a floor covering.

2

Another and further object of my invention is the provision of a closed loop fabric for use as a floor covering which can be produced in either a single shot, a two shot or a three shot special weave in which continuous strands of pile yarn are fashioned into loops, and anchored in the base fabric with other loops forming the wearing surface of the fabric.

Another and further object of my invention is the provision of a fabric in which a plurality of strands of yarn may be used to provide two loops of pile in side to side relation with each other or the fabric may be woven with the loops crossing each other, and in which yarns of contrasting colors are used thus producing a fabric having a variable coloring and attractive in appearance.

These and other objects of my invention will be more fully and better understood by reference to the accompanying drawings and in which:

Figure 1 is an enlarged plan view of a section of fabric showing loop tufts forming the pile of the fabric;

Figure 2 is an end view of the section fabric shown in Figure 1;

Figure 3 is an enlarged plan view of a piece of fabric having loops crossing each other produced by a loom with double needle bars which shift in opposite directions;

Figure 4 is a perspective view of a section of fabric shown in Figure 3;

Figure 5 is an enlarged cross sectional view of a piece of one shot weave single closed loop fabric with four warps between each row of pile loops;

Figure 6 is an enlarged sectional view fillerwise of a piece of fabric having double strands of closed loop pile;

Figure 7 is an enlarged sectional view through a piece of one shot double closed loop fabric taken on a line through the fabric where the warps cross;

Figure 8 is an enlarged sectional view of a two shot fabric of a single yarn loop tuft showing warps having equal tension;

Figure 9 is an enlarged section view of a two shot weave showing warps having unequal tension and a single yarn looped tuft;

Figure 10 is a detailed view of a portion of a loom used in weaving a three shot single strand loop pile fabric as shown in Figures 1 and 2;

Figure 11 is a detailed view of a portion of a loom used in weaving a three shot fabric with either a single or double strand loop pile with the pile guide carrying the pile yarn below the loop forming fingers;

Figure 12 is a detailed view of a portion of a

loom used in weaving a one shot single or double strand loop pile fabric with the pile yarn guides above the loop forming fingers; and

Figure 13 is a detailed view of a portion of a loom showing the result obtained with double pile yarn guides shifting in opposite directions.

Referring now specifically to the drawings and in which like reference characters refer to like parts throughout a section 10 of one form of fabric having loop pile is shown having a plurality of strands of pile yarn formed in loops 11, 11 constituting a wearing surface for the said fabric and which may be either a one, two, or three shot weave, the loops 11, 11 as shown in Figures 1 and 2 being formed of a single strand of yarn as hereinafter described. Various types of base fabrics may be used, one type of which is shown in Figure 2 where the base fabric is composed of a plurality of groups of warps, each group preferably being in spaced relation with other groups, each group consisting of two stuffer warps 12 and 13 and a weaving warp 14 combined with strands 15 of pile yarn carried into the shed of the loom by guides 16, 16 mounted in a bar 17, the pile yarn 15 passing through eyelets in the end of the guides 16, 16, which are moved into and out of the shed of the loom and shogged over the fingers 18 by suitable loom mechanism to form the loops 11, 11 over the fingers 18 and which loops slide over the ends of the fingers which project upward from the base fabric to form the wearing surface of the fabric.

Shots of filler 19, 20, and 21 (Figure 2) are placed in the fabric by a needle forming a part of a loom described in my co-pending application Serial No. 566,853, now Patent No. 2,437,378, and which forms no part of my present invention. One shot 20 is between the stuffer warps 12 and 13 and against the forward edge of the leg 22 of one of the loops 11, 11 with the shot of filler 21 being below the stuffer warps 12 and 13 and above the weaving warp 14 and through a loop 24 connecting the legs 22 and 23 and their bottom with the third shot of filler 19 being above the stuffer 13 and abutting the leg 23 at its rear, assuming that the fabric while being woven moves from right to left (Figure 2). The pile yarn strands 15 are woven into the base fabric in the form of continuous strands looped into the base fabric with shots of filler 21 through the base loops and other shots 19 and 20 on each side of the loops and in abutting relation therewith, so the loops are held in self-retained position in the fabric.

A single shot weave is illustrated in Figure 5 wherein groups of warps, preferably four in number, 25, 26, 27, and 28, are shown, each adjacent warp being shedded in opposite directions, with a single strand 15 of pile yarn being woven in the base fabric by the use of the single guide 16 (Figure 11) mounted in the back bar 17, but with a four warp arrangement as is shown in Figure 12, the pile yarn strand 15 being shogged over the fingers 18, 18, the detailed operation of which is described in my co-pending applications Serial Nos. 660,573, now Patent No. 2,437,379, and 746,227, now Patent No. 2,578,173, and forms no part of my present invention. The strand of pile yarn 15 is formed into continuous loops such as the surface loops 29, 29 and internal loops 30, 30, the legs of which are on opposite sides of the group of warps 25, 26, 27, and 28, and the loops 30, 30 have shots of two strand filler 31, 31 passing therethrough, which hold the loops 30, 30 in self-retained position in the base fabric.

A single shot fabric is shown in Figures 6 and 7 having surface pile loops 32 and 33 which lie in parallel relation with each other throughout their length and which are produced by the means shown in Figures 11 and 13 of the drawings and more fully described in my said applications heretofore identified. In addition to the back bar 17 and pile yarn guides 16, 16 mounted therein a front bar 34 with pile yarn guides 35, 35 mounted therein are provided having strands of pile yarn 36, 36 threaded through the said guides at their ends, and which by suitable shifting means described in each of my co-pending applications Serial Nos. 566,853 and 660,573, are shogged over the fingers 18, 18 prior to their descent into the shed of the loom, forming the loops 32 and 33 as they descend, and the looped bases around the filler shots 31, 31 as they ascend between the fingers 18, 18 and also between the groups of warps. In this form of fabric the bars 17 and 34 are simultaneously shifted in the same direction over the fingers which produces the two loops 32 and 33 in the side to side relation as shown in Figures 6 and 7.

The fabric illustrated in Figures 3 and 4 is a one shot weave in which the bars 17 and 34 and pile yarn guides 16 and 35 are shifted in opposite directions prior to the descent of the guides 16 and 35 into the shed of the loom. The shifting of the guides 16 and 35 in opposite directions crosses the pile yarns 15 and 36 (Figure 13) and produces crossed surface loops 37 and 38 from the yarns 15 and 36, this process being particularly illustrated in Figure 13 of the drawings. The pile yarn strands 15 and 36 may be of contrasting colors and when the loops 37 and 38 cross each other, a mottled color effect is produced in the fabric and may also be contrasting in color when the loops such as 32 and 33 are placed in side to side relation with each other, thus also producing a mottled appearance to the fabric and different than when the pile loops cross each other.

A two shot fabric is illustrated in Figures 8 and 9, the surface loops 39, 39 in each instance being formed of a single strand of pile yarn with shots of weft or filler yarn 31, 31 being placed through the looped base portions of each of the loops 39, 39 and also between each of the said base portions, with four ground warps 25, 26, 27, and 28 being used over which the said pile loops extend, each of these ground warps being equal in tension as shown in Figure 8, similar to the warps shown in Figure 5, thus placing the shots of filler 31, 31 in the fabric in the same level. A loop pile fabric is thereby woven comprising ground warps having weft or filler shots interwoven therewith and pile yarn or threads passing under a weft or filler shot and over four ground warps under a weft shot and back over the same four ground warps, thereby completing a cycle of interweaving with the weft shots and producing pile loops each extending both warpwise and weftwise of the fabric. A fabric having warps similar in number and arrangement, woven in the same manner as hereinabove described but with different tension is illustrated in Figure 9, which when the fabric is beat up places the filler shots 31, 31 at different levels thus serving to hold the loops more securely in a self-retaining position in the fabric than if the warps were the same tension and the shots of filler at the same level.

It will thus be understood that a base fabric of either one, two, or three shot filler type may be employed in the production of the fabric of

my invention, and that looped pile may also be produced composed of single strands of pile yarn, or a plurality of strands of pile yarn with the pile loops nested together or with the loops crossing each other as may be desired, the essential feature of novelty being in the strands of pile yarn fashioned into closed loop pile placed between and passing over selected groups of warps and around the filler on each side of the group of selected warps.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form and the proportion of parts and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit or scope of my invention.

What is claimed is:

1. A loop pile fabric comprising ground warps, weft shots interwoven therewith, and pile threads passing under alternate weft shots and over intermediate weft shots, each said pile thread passing under a weft shot, over four ground warps, under a weft shot and back over the same four ground warps to complete a cycle of interweaving with the weft shots whereby to form pile loops each extending both warpwise and weftwise.

2. A pile carpet fabric comprising in combination a ground fabric interwoven with groups of warp yarns and groups of filler yarns, and a pile composed of continuous strands of yarn interwoven into the ground fabric in self-retaining position therein, and in loop form extending through to the back of the ground fabric and above the surface of the ground fabric to form a pile, the loops above the ground fabric passing fillerwise over one set of warp yarns and having at least one set of filler yarns pass through the looped pile yarn in the ground fabric below certain of the warps, the loops in the ground fabric being compressed by each other and by the warp and filler yarns into self-retaining position therein.

3. A loop pile fabric comprising a plurality of groups of ground warps, weft shots interwoven therewith and pile threads passing under selected sets of weft shots, and over other selected sets

of weft shots and laterally over one set of ground warps, under a weft shot below the sets of ground warps and back over the same set of ground warps to complete a cycle of interweaving whereby pile loops are formed each extending both weftwise and warpwise of the fabric, with the leg portions of adjacent loops offset with respect to each other in a warpwise direction whereby the said pile loops are brought into supporting side-to-side relation with each other and forming a tread surface on the tops of pile loops.

4. A loop pile fabric comprising ground warps, filler shots interwoven therewith and pile threads passing under selected filler shots and fillerwise over selected sets of ground warps, under a filler shot and back over the same selected set of ground warps to complete a cycle of interweaving with the weft shots whereby to form pile loops each extending both warpwise and fillerwise, the ground warps being displaced fillerwise of the fabric and compacted at their point of crossing each other whereby the bases of the pile tufts are compressed fillerwise of the fabric both above and below the filler shots.

EUGENE F. CLARK.

References Cited in the file of this patent UNITED STATES PATENTS

	Number	Name	Date
30	549,372	Klein	Nov. 5, 1895
	1,064,482	Hirst	June 10, 1913
	1,816,574	Foster et al.	July 28, 1931
35	1,999,067	Stevenson	Apr. 23, 1935
	2,144,555	Sudell	Jan. 17, 1939
	2,285,332	Gebert	June 2, 1942
	2,318,499	Keen	May 4, 1943
	2,345,337	Gardner	Mar. 28, 1944
40	2,355,789	Faber	Aug. 15, 1944
	2,578,173	Clark	Dec. 11, 1951

FOREIGN PATENTS

	Number	Country	Date
45	7,890	Great Britain	of 1898
	162,567	Germany	Sept. 20, 1905
	269,285	Germany	Jan. 16, 1914
	554,141	Germany	July 2, 1932
	665,665	Germany	Sept. 30, 1938