Jan. 17, 1939. F. SUDELL 2,144,555

BATH MAT, ETC

Filed March 1, 1937 2 Sheets-Sheet 1

Fig. 7.

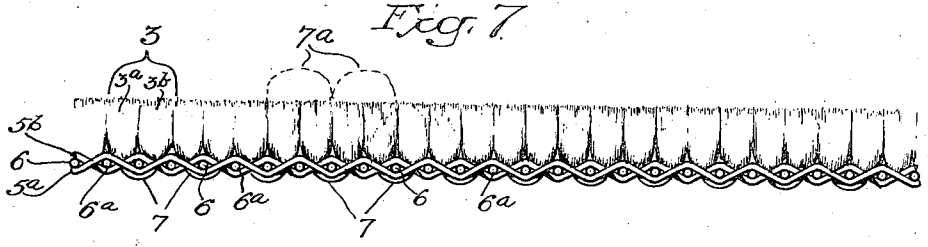


Fig. 6.

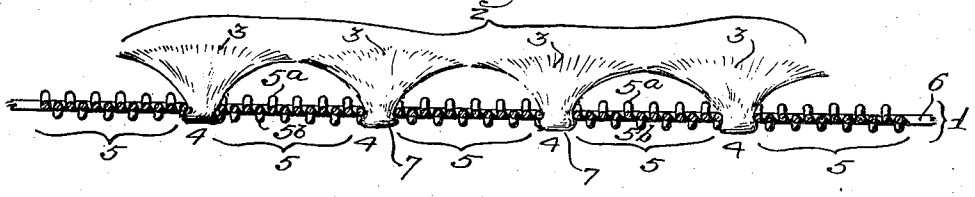


Fig. 5.

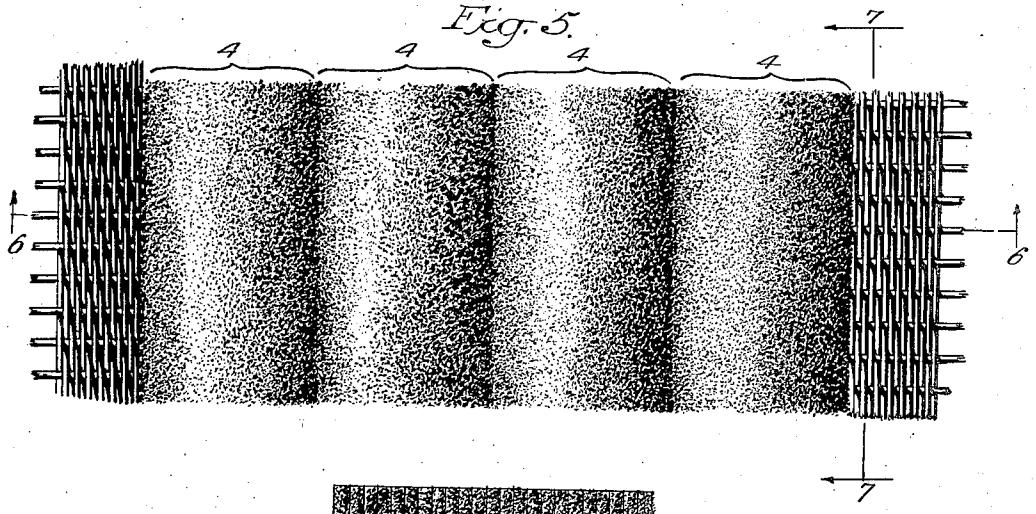
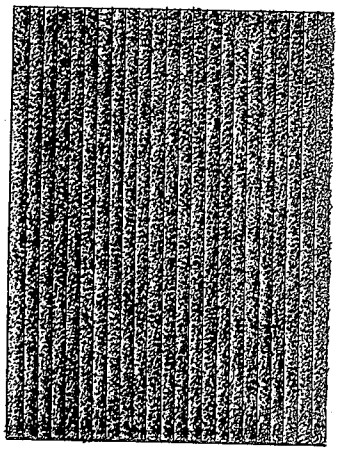


Fig. 1.



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Jan. 17, 1939. F. SUDELL 2,144,555

BATH MAT, ETC

Filed March 1, 1937 2 Sheets-Sheet 2

Fig. 8

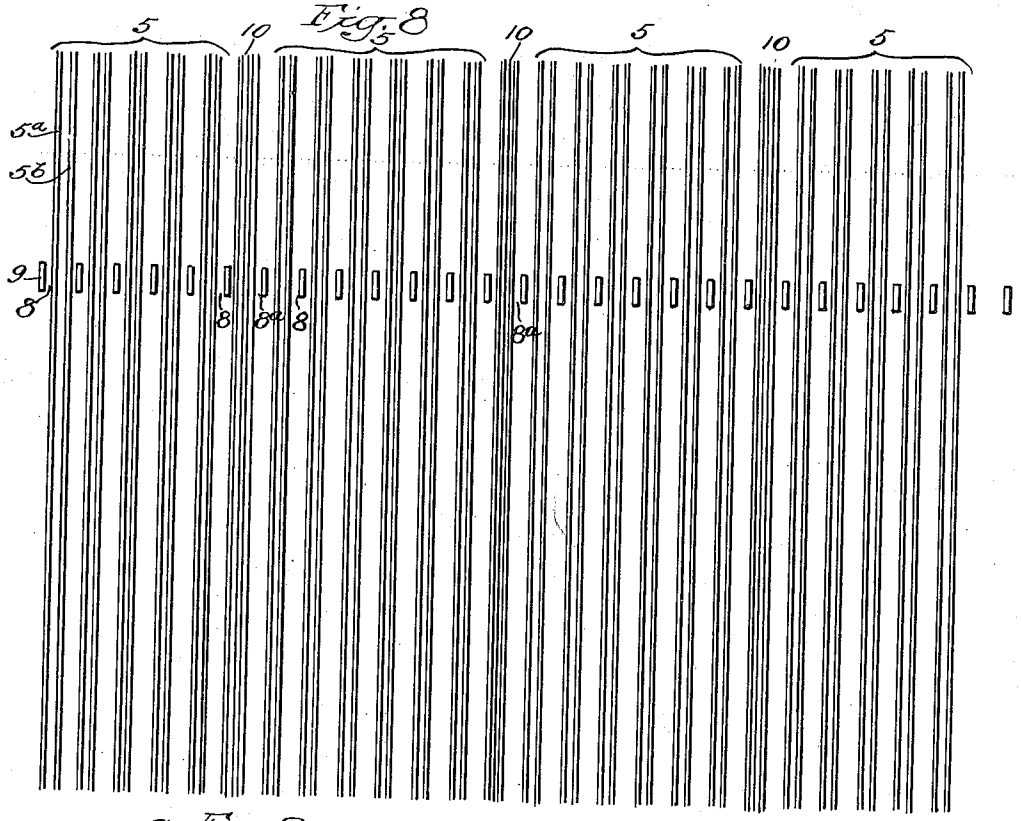


Fig. 2

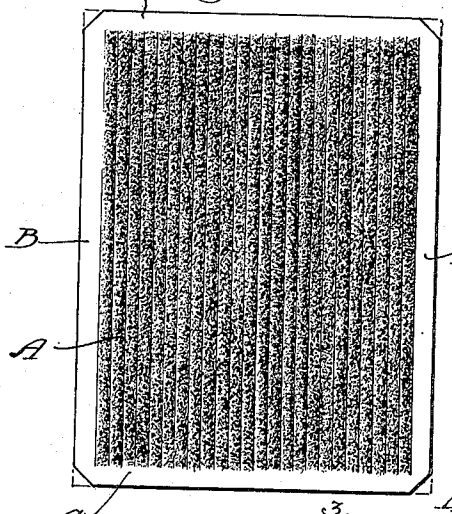


Fig. 3

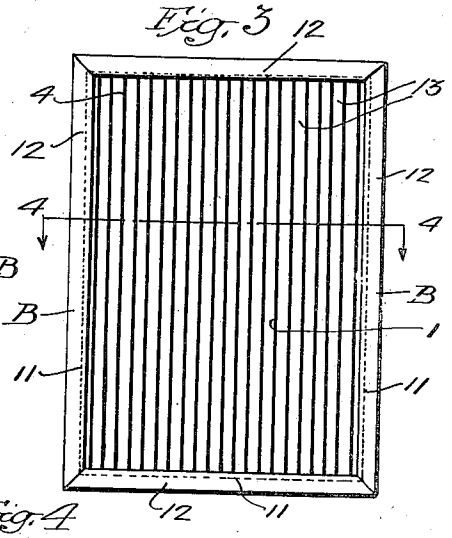
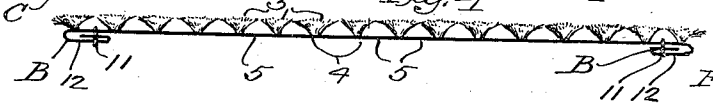


Fig. 4



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UNITED STATES PATENT OFFICE

2,144,555

BATH MAT, ETC.

Frank Sudell, Roxborough, Pa., assignor to La France Industries, Philadelphia, Pa., a corporation of Pennsylvania

Application March 1, 1937, Serial No. 128,522

3 Claims. (Cl. 139—391)

This invention relates to the manufacture of bathroom accessories, such as floor mats or rugs, toilet-lid and stool covers, etc. The present invention particularly concerns articles of the above noted kinds when comprising a tufted pile face formed on a closely woven base fabric.

Prior to the present invention it was customary to weave the base fabrics first. The base fabric usually consisted of light-weight canvas. The canvas was subsequently cut to the size and shape of the article desired. The tufted pile face was subsequently formed on one side of the base fabric with a sewing or tufting machine, the needle of which, carrying a relatively heavy pile-forming yarn, punched the yarn through the base fabric from one side thereof to and beyond the opposite side of the canvas in the form of single individual pile-forming loops, one after another, in laterally spaced rows, each tuft and each row being formed separately. The pile-forming loops were subsequently cut to form the pile tufts. This mode of manufacture required considerable time and labor which necessitated the articles being sold at relatively high prices.

The object of the present invention is to form articles similar to those noted above, under an improved process or mode of manufacture wherein the base fabric and the tufted pile face, with the tufts extending in laterally spaced rows, are simultaneously produced, by weaving, and wherein the desired number of rows of tufts are simultaneously formed at the same time that the light-weight base fabric, similar to canvas, is being woven.

In the accompanying drawings:

Fig. 1 is a diagrammatic face view of a completed article, such as a bath mat, made in accordance with the principles of the present invention;

Fig. 2 is a similar face view of the mat after weaving and before finishing;

Fig. 3 is a view of the back face of the mat shown in Fig. 2, after finishing;

Fig. 4 is a longitudinal sectional view taken on the line 4—4, Fig. 3;

Fig. 5 is a fragmentary face view drawn to an enlarged scale;

Fig. 6 is a weftwise sectional view taken on the line 6—6, Fig. 5;

Fig. 7 is a warpwise section taken on the line 7—7, Fig. 5; and

Fig. 8 is a diagrammatic view illustrating the manner in which the warp is tied in the loom and passed through the dents in the lay thereof to produce the fabric shown in detail in Figs. 5, 6 and 7.

As shown in Figs. 5, 6 and 7, the article comprises a base fabric 1 and a pile face 2 formed on one side or face of the base fabric, said pile face comprising pile tufts 3 disposed in warpwise extending parallel laterally spaced rows 4. The individual tufts 3 on the pile face 2 of the article are preferably packed close together longitudinally of each row 4 to blend one with the other and thereby lose their individuality on the pile face 2, as indicated in Fig. 5.

The base fabric 1, in the present instance, is composed of laterally spaced groups of body or ground warps 5. The groups 5 alternate, weftwise of the fabric, with and lie intermediate the rows 4, 4 of the pile tufts 3. Each group 5 of said warp threads is divided into two series, indicated at 5*a* and 5*b* respectively. The warp threads 5*a* and 5*b* are interwoven with and pass alternately over and under successive weft threads 6 and 6*a* respectively, to form the base fabric 1 of the article. The weft threads 6*a* alternate with the weft threads 6 throughout the length of the fabric 1.

The pile tufts 3 pass around the under sides of the weft threads 6 in bottom loops, as indicated at 7 in Figs. 6 and 7, with the legs or ends 3*a* and 3*b* of each tuft 3 passing upwardly through the fabric between the wefts 6, about which the tuft loops 7 are formed, and the intermediate wefts 6*a* lying on either side of each weft 6.

The tufts 3 may be composed of a single relatively heavy loosely twisted yarn or of a plurality of finer gage loosely twisted yarns which will lend themselves to the formation of the tuft rows 4.

Prior to the weaving of the article, the groups of warp threads 5, 5 are positioned in the loom in the manner illustrated in Fig. 8. One warp 5*a* and one warp 5*b* from each of the two series constituting each group are passed through a single dent 8 in the reed 9 of the loom on which the fabric is to be woven.

Intermediate each pair of adjacently disposed groups of base fabric ground warps 5 a single pile-forming yarn unit composed of one or a plurality of pile-forming yarns, indicated at 10, is passed through the dent 8*a* in the reed 9 which lies intermediate the dents 8 occupied by the ground warp pairs 5*a* and 5*b* disposed at the sides of said adjacently disposed groups 5. For example, every seventh dent in the reed is occupied by a pile thread unit 10. The intermediate

dents each receive one pair of the body or ground warps 5a and 5b.

Preferably articles, such as shown in Figs. 1, 2 and 3, are woven in continuous strips with a predetermined number of articles in each strip, and during the weaving of the strip it is preferred to form non-pile longitudinal marginal strips B, B (see Fig. 2) at each side of each pile area A.

If the loom is of sufficient width to weave a plurality of articles side by side simultaneously longitudinal or warpwise non-pile strips corresponding to the strips B may be woven intermediate the pile areas of the strip.

In addition to the longitudinal marginal strips B, B, non-pile strips C may be formed transversely or weftwise of the fabric, intermediate successive pile areas A, A.

After the weaving of a strip composed of a plurality of articles the articles may be separated along the line through the center of the non-pile transversely extending areas C, C; and if the strip contains a number of articles woven side by side separation of the articles will be made through the centers of the intermediate longitudinally or warpwise extending non-pile areas corresponding to those illustrated at B, B in Fig. 2, whereby each article will consist of a pile faced area A with longitudinal or warpwise marginal non-pile areas B, B at the opposite sides respectively of the pile area A and with transversely or weftwise extending non-pile marginal areas or headings C, C at the opposite ends respectively of the pile area A.

In finishing the articles the marginal areas B, B and C, C are folded inwardly under the back of the base fabric 1 and stitched thereto, as indicated at 11, to form bound edges or hems 12, 12 completely around the article.

In weaving the base fabric 1, the body warps 5a and 5b are alternatively raised and lowered while the wefts 6 and 6a are being passed through the open warp sheds formed by the warp threads 5a and 5b and beaten up by the reed 9 to form a close woven fabric as illustrated in Fig. 5 with the warps 5a and 5b alternating weftwise of the fabric and lying in relatively close adjacent or laterally abutting relation to each other.

When the body warps 5a are lowered and the pile warps 5b are raised, to form an open warp shed for the reception of a weft thread 6, the pile-forming warps 10 are lowered with the body warp 5a and when the shed changes for the reception of the next weft 6a the body warps 5a are raised to one elevation, the body warps 5b are lowered and the pile warps 10 are raised to a higher elevation than the body warps 5a to form a double warp shed. The lower of the two sheds, that is, the warp shed formed between the body warps 5a and the body warps 5b, receives the weft 6a while the upper shed formed between the pile warps 10 and the body warps 5a receives a pile wire or equivalent structure over which the pile warps are formed into top loops 7a upon the next change of the warps, wherein the body warps 5a and pile warps 10 are lowered while the body warps 5b are raised for the reception of the next weft 6 and around which the pile warps 10 are formed in the bottom or tie loops 7.

During the weaving of the non-pile areas C, the pile warps 10 may be passed alternately over and under the weft threads 6 and 6a with the body warps 5a, without passing over any pile-forming wires when the wefts 6a are introduced, or the pile-forming warps may be maintained in a low position at all times below the wefts 6 and 6a during the weaving of the heading or marginal areas C and in which case the pile-forming warps 10 would become as floats on the back of the fabric across the heading areas C and which could be readily removed prior to the folding of the non-pile area C in producing the hem 12 at the end of the article.

Obviously, in place of weaving the strips as single fabrics with the use of pile wires to form the top or pile loops, on a single shuttle loom as described, the articles may be woven in double strip form, that is, with two base fabrics woven in superposed vertically spaced parallel relation to each other, with the pile-forming threads extending from the base fabric of the upper strip to the base fabric of the lower strip, and vice versa with suitable spacers between the two base fabrics for keeping the strips separated a predetermined distance apart and thereby regulating the length of the pile threads between the superposed base fabrics and which, when the base fabrics are separated, by splitting the double fabric strip in a plane intermediate that of the upper base fabric and that of the lower base fabric, controls the lengths of the legs 3a and 3b of the pile tufts 3 attached to each of the base fabrics.

In double weaving, as noted above, there would be four body-forming warps in each dent of the reed, in place of the two as in single weaving. However, single pile-forming warp units 10 would extend through each of the dents 8a, the same as in the single weaving. The double fabric preferably would be woven on a double shuttle loom.

In either the single or double weaving, various colors of pile-forming warps may be used in each of the dents 8a and controlled by suitable pattern-forming mechanism such as a common Jacquard dobbie, or other mechanism for manipulating the pile-forming threads individually or otherwise to produce various designs on the pile face of the article.

From the above, it will be clear that during weaving the pile-forming warps 10 are maintained in laterally spaced relation to each other a distance equal to the width of the groups 5 of the body warps 5a, 5b and thereby, in the finished product, provide the laterally spaced rows of pile tufts 4. The groups 5 of body-forming warp threads are also spaced apart laterally by and disposed intermediate the pile-forming warps 10, leaving in the finished fabric longitudinally extending strips of non-pile fabric, indicated at 13, 13 in Fig. 3, between the rows 4 of tufts 3 and which are separated by the parallel laterally spaced rows of pile tufts 4 on the back face of the fabric.

The lateral spacing of the rows of pile tufts, with the strips of plain fabric 13 therebetween, permits the pile tufts to spread laterally across the intermediate plain strips 13 and the lengths of the legs 3a and 3b of the pile tufts 3 are made in such proportion to the distance between the rows of pile tufts that, when the pile tufts spread laterally as noted, the edge of one row of tufts lies substantially in abutting relation to the edge of the adjacent row of tufts, on the pile face of the article, and produces in said pile face a longitudinally or warpwise extending ribbed or corrugated effect, such as shown in Figs. 1 and 5.

By weaving the pile tufts in rows simultaneously with the weaving of the body or base fabric the speed of production of the individual articles is materially increased over the old method above referred to, with a consequent saving of cost to

the manufacturer and a consequent reduction in ultimate cost to the consumer.

I claim:

1. An article of manufacture consisting of a unitary woven structure including a base fabric composed of interwoven warp and weft threads and a face composed of cut-pile tufts formed of single pile warp thread units interwoven with alternate weft threads of said base fabric and arranged in continuous substantially parallel laterally spaced rows extending warpwise of the fabric with non-pile strips of said base fabric therebetween and with each of said single pile warp thread units solely forming one of said laterally spaced rows of pile tufts and with the tufts in each row disposed in closely packed relation to each other longitudinally of the row, each of said pile tufts being of a length substantially equal to half the distance between said rows and spread laterally over the non-pile strips at the opposite sides respectively of the row.

2. An article of manufacture consisting of a unitary woven structure including a base fabric composed of interwoven warp and weft threads and a face composed of cut-pile tufts formed of single pile warp thread units interwoven with alternate weft threads of said base fabric and arranged in continuous substantially parallel laterally spaced rows extending warpwise of the fabric with non-pile strips of said base fabric therebetween and with each of said single pile warp thread units solely forming one of said laterally spaced rows of pile tufts and with the tufts in each row disposed in closely packed relation to each other longitudinally of the row, each of said pile tufts being of a length substantially equal to half the distance between said rows and spread laterally over the non-pile strips at the opposite sides respectively of the row and with the tips of the tufts of adjacent rows substantially meeting along lines overlying said non-pile strips between said rows and substantially hiding the strips of non-pile base fabric lying between the rows.

3. An article of manufacture consisting of a unitary woven structure including a base fabric composed of interwoven warp and weft threads and a face composed of cut-pile tufts formed of single pile warp thread units interwoven with alternate weft threads of said base fabric and arranged in continuous substantially parallel laterally spaced rows extending warpwise of the fabric with non-pile strips of said base fabric therebetween and with each of said single pile warp thread units solely forming one of said laterally spaced rows of pile tufts and with the tufts in each row disposed in closely packed relation to each other longitudinally of the row, each of said pile tufts being of a length substantially equal to half the distance between said rows and spread laterally over the non-pile strips at the opposite sides respectively of the row and with the tips of the tufts of adjacent rows substantially meeting along lines overlying said non-pile strips between said rows and substantially hiding the strips of non-pile base fabric lying between the rows and producing a substantially wide rounded topped ribbed effect on said face of said article.

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