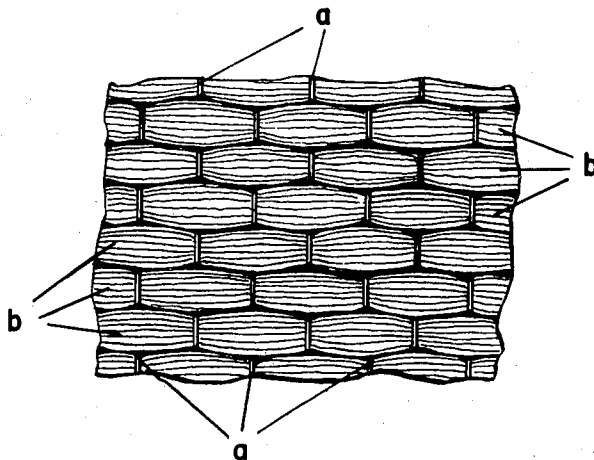


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MANUFACTURE OF BLANKETS, BLANKET MATERIAL,
FELT SUBSTITUTES, AND CARPET MATERIAL
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MANUFACTURE OF BLANKETS, BLANKET MATERIAL, FELT SUBSTITUTES, AND CARPET MATERIAL

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This invention relates to the manufacture of jute fabrics and their treatment for the purpose of producing a mercerised or woollenised finish. The fabrics so produced may be formed into blankets or be in the nature of blanket material, or substitutes for felts or even for certain kinds of carpets or the like.

It is known to mercerise or to woollenise jute and no claim is made to mercerisation or woollenisation per se.

It has been known for a long time that mercerisation (treatment with strong caustic) of jute fibre tends to give it a softer and somewhat wool-like character. Mixed wool-jute fabrics are also known.

The process it is now proposed to employ comprises more than processes of simple mercerisation as it takes into consideration the kind of weave to employ and the relationship of the twist of the warp to that of the weft.

The object of the invention is to concentrate the mercerisation or woollenisation treatment upon parts of the fibres which form the fabric so that, whereas the caustic or chemical reagent for mercerisation and/or woollenisation is applied to the whole surface of the cloth, it will penetrate more easily into those parts of the fibres where treatment is most desired. The fibres in which mercerisation and/or woollenisation is actually desired are those which constitute the weft threads in the woven cloth. These weft threads constitute the major part of the surface of the cloth. To enable the caustic or other treating agent to act most effectively upon the weft threads these weft threads are much more loosely spun than the warp threads—they are thus much more open and bulky relatively to the material therein than the warp threads—and thus their visual bulk relatively to the weight of fibre therein is considerably larger than that of the warp threads.

The warp on the contrary is a hard spun, relatively thin but strong warp upon which the caustic will not act so effectively, as owing to the closer texture of the warp threads the caustic will penetrate more slowly.

The fabric to be operated upon and woollenised is thus one having a hard spun relatively thin but strong warp and a relatively thick loosely spun weft.

It has been found best to use a relatively thick loosely-spun weft (rove twist) as compared with a thin well-spun hessian warp.

In order to weave the cloth for the purposes of this invention it is essential to have thin,

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strong warp threads, because the weft threads which it is contemplated to use are of a looser and more open texture and of considerably greater bulk, and if the warp threads were of the same nature as the weft it would be difficult if not impossible to weave—and, if the weaving could be accomplished, the cloth would be too weak.

One object of the invention is thus to start with warp threads which are hard-spun, thin and strong and may indeed be harder spun and stronger than generally used—and which owing to their texture will afford some protection against—or will slow up—the penetration of caustic. The weft threads are of a relatively thick loosely spun type—bulking, for the weight of fibre therein, considerably larger than the warp threads—in fact the weft threads may be rove twist and for equal weights of fibre have twice or more than twice the bulk of the warp threads. In such conditions the caustic or agent will penetrate the weft threads more readily and effectively than it would penetrate the warp. Moreover with the larger bulk of the weft threads they will more effectively cover over the warp threads, so that the exposed surface of the woven cloth will practically all be of the thicker, looser and more easily penetrated weft, so that when the so-woven cloth is passed through a bath of caustic or treating agent it will first and most effectively be attacked by the contents of the bath and the weft threads will protect the warp threads—particularly if the period of treatment in the bath is short.

The object of the invention is thus to produce in the first instance a woven fabric of the nature indicated and subsequently to treat the fabric to cause woollenisation or partial woollenisation of the weft threads and particularly of the surface which is nearly all formed of such weft threads.

On the accompanying sheet of drawing, the single figure shows diagrammatically, in top plan view, a portion of a fabric according to the invention.

In weaving the cloth any desired kind of weave may be employed—for example a simple plain weave—or a twill weave. It has however been found that a broken twill weave may advantageously be used—but the invention is not restricted to one in which such a weave alone is used.

The treatment of the material with caustic or other treating agent is effected upon the woven cloth.

The chemical treatment consists in immersing the cloth in a caustic solution, for example, a caustic soda solution of 10 to 15% strength, until

mercerisation is sufficiently complete. This usually takes about 5 to 20 minutes, depending upon the character of the jute fibre, the twist in the yarn, the caustic concentration and the temperature.

The desired arrangement envisages a continuous process, in which the cloth passes through a shallow caustic bath, which is kept up to a given strength by circulation through an outside replenishing tank, the caustic leaving the mercerising bath at the point where the cloth enters the same and thus operating on the counter-flow principle.

As the jute cloth leaves the bath it preferably passes through heavy squeezing rollers, which remove most of the free caustic and return the said removed caustic to the bath; the cloth is then washed, preferably in hot water, to remove the remaining caustic. In the preferred arrangement, the washes could go back to the main caustic tank where the concentration is kept up by the addition of strong caustic.

When the cloth has been freed from caustic by washing it is preferably given a final wash with soap and water. At this stage mangling or mechanical treatment may be given accompanied by the addition of a certain amount of oil emulsion or the like, further to soften the cloth. It is then dried out and subjected to a nap raising treatment which may be of any suitable, desirable and/or conventional character.

A cloth mercerising machine may be used if a continuous process is adapted and the cloth be held in a stretched position to reduce the amount of shrinkage which otherwise always occurs upon the mercerisation of cotton or other vegetable fibres.

As may be seen from the figure of drawing on the accompanying sheet of drawing, the fabric according to the invention, in ordinary plain weave, may comprise hard spun, thin and strong warp threads shown at *a* and relatively thick and loosely spun weft threads shown at *b*.

The invention comprises a process for the manufacture of a jute fabric in the form of a blanket, blanket material, felt substitute or carpet material, which consists in weaving the cloth using a hard-spun relatively thin but strong warp and a relatively thick loosely-spun weft (for example of rove twist), whereby a woven cloth is produced in which the greater part of the visual bulk of the material, both before and after weaving, is constituted by the loosely spun weft, which weft is thus in a condition which can more readily be acted upon (than can the warp) by the caustic to be used and can more easily be "nap raised," passing the so-woven cloth through a bath of caustic, or otherwise treating it with caustic, washing out the excess caustic and submitting the cloth to a nap raising process on one or on both sides.

In the manufacture of this fabric any desired weave may be employed; but a broken twill weave will preferably be employed in weaving the fabric.

This process of manufacture may be one in which the caustic is applied of such a strength and for such a time period as to produce by a process of mercerisation a woollenising effect upon the weft threads.

The caustic solution may conveniently be one having a strength of 10 to 15% if caustic soda is used for the mercerisation of the fabric, and the process be so arranged that it (this caustic) is mainly operative upon and is caused to act

upon the loosely spun weft fibres which show on the surface of the fabric, and have little action upon the more tightly spun hessian warp which is not so much affected by and not so much acted upon by the caustic as is the weft.

In this process of manufacture the treatment with the caustic solution may be for a short period, for example from a few minutes to about half an hour, depending upon the results required. Preferably, however, the treatment with caustic is effected for a period of from 5 minutes to 20 minutes.

In carrying out the process of manufacture the jute cloth, after weaving, is passed through a bath of caustic in which it meets the caustic moving in the counter-flow direction to the direction of movement of the cloth. The strength of the caustic may be kept up to a desired degree by continuous or intermittent additions of caustic to the bath.

The cloth, after passing through the caustic bath, is, according to a preferred process, passed through rollers to squeeze out caustic from the cloth.

The caustic squeezed out of the cloth may be returned to the caustic bath.

According to one manner of carrying out the process of manufacture, the cloth, after treatment with the caustic, is washed and the first washings are returned to the caustic bath to be mixed with fresh strong caustic therein. Alternatively, the final washings may be returned to a recovery bath for recovery of caustic therefrom.

The cloth may be subsequently washed in hot water after passing through the caustic bath. It may further, or alternatively, be washed with soap and water. When a blanketing material is desired, the cloth, after treatment with caustic, and/or after subsequent washing is subjected to a mangling or mechanical treatment, accompanied, if desired, by the addition of oil or softening emulsions, further to soften the fibre.

Finally, the cloth, after treatment with caustic and after washing, is dried and it is subjected to a "nap raising" treatment applied to one or to both sides of the cloth. Alternatively, the cloth is treated in a mercerising machine to deal with the cloth in a stretched condition and is subsequently treated, as may be desired, and "nap raised."

The invention thus includes a process for making a blanket, blanket cloth, felt substitute or carpet or other material from jute in the manner hereinbefore described in which the weft, being more loosely spun than the warp, is more completely mercerised and woollenised than the warp by the use of caustic, and is subsequently washed and "nap raised."

The invention also includes a blanket, blanket cloth, felt substitute, carpet or other woollenised material made wholly or mainly of jute fibre, when made in accordance with the manner or processes hereinbefore set forth.

Cross-reference is made to my co-pending application Ser. No. 565,432 which deals with production of a woollenised jute fabric which is woven from a thin hard-spun warp and a mercerised loosely-spun weft, the mercerisation having preceded the weaving.

I claim:

1. A process for the manufacture of a differentially woollenised jute fabric, which comprises weaving the fabric with a hard-spun relatively thin but strong warp and a relatively

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thick loosely-spun weft, whereby a woven fabric is produced in which the greater part of the visual bulk of the material is constituted by the loosely-spun weft, which weft is thus in a condition which can more readily be acted upon by the caustic to be subsequently used and can more easily be "nap raised," subjecting the so-woven fabric to a treatment with caustic until the weft is substantially completely woollenised, washing out the excess caustic before any appreciable woollenising of the warp takes place, and submitting the resultant fabric to a "nap raising" treatment.

2. A process for the manufacture of a differentially woollenised jute fabric according to claim 1, in which a broken twill weave is employed in weaving the fabric.

3. A differentially woollenised textile fabric having a thick and loosely-spun jute weft and a thin and hard-spun jute warp, whereby the bulk of the weft is considerably greater than that of the warp and the latter is initially relatively non-permeable by liquid as compared with the initially easily permeable weft, and whereby the surface of the fabric is constituted primarily of weft, said weft being substantially completely woollenised and said warp remaining substantially un-woollenised.

4. A differentially woollenised woven textile fabric, wherein the weave is a broken twill weave, having thick and loosely-spun jute weft and a thin and hard-spun jute warp, whereby the bulk of the weft is considerably greater than that of the warp and the latter is initially relatively non-permeable by liquid as compared with the initially easily permeable weft, and whereby the surface of the fabric is constituted primarily of weft, said weft being substantially completely woollenised and said warp remaining substantially un-woollenised.

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5. A differentially woollenised textile fabric having a thick and loosely-spun jute weft and a thin and hard-spun jute warp, whereby the bulk of the weft is considerably greater than that of the warp and the latter is initially relatively non-permeable by liquid as compared with the initially easily permeable weft, and whereby the surface of the fabric is constituted primarily of weft, said weft being substantially completely woollenised and said warp remaining substantially un-woollenised, and at least one side of the fabric having a raised nap, said fabric having been produced according to the process of claim 1.

6. A differentially woollenised textile fabric having a thick and loosely-spun jute weft and a thin and hard-spun jute warp, the bulk of the weft being, for equal weights of fiber, at least twice that of the warp, whereby the latter is initially relatively non-permeable by liquid as compared with the initially easily permeable weft, and whereby the surface of the fabric is constituted primarily of weft, said weft being substantially completely woollenised and said warp remaining substantially un-woollenised.

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