

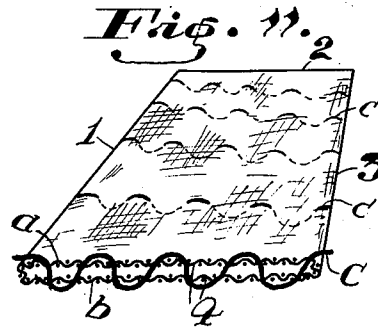
Nov. 28, 1933.

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1,936,974

PROCESS IN THE MANUFACTURE OF WOVEN FABRICS

Filed April 25, 1931



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UNITED STATES PATENT OFFICE

1,936,974

PROCESS IN THE MANUFACTURE OF
WOVEN FABRICSErnst Harald Wallin, Arvika, Sweden, assignor
to Cajs-Marie Wallin, Arvika, SwedenApplication April 25, 1931, Serial No. 532,937,
and in Sweden April 28, 1930

7 Claims. (Cl. 28—1)

This invention relates to a process of manufacturing woven fabrics of any origin, such as round-woven fabrics for technical purposes, for instance felting intended for the paper- and printing industries, for ironing institutions and several other industries; further, bags and sacks as well for technical as for civil use. Especially this invention has for its object to render it possible to obtain a smoother product which is better in all respects than prior products. Thru the process according to this invention it is also possible to produce entirely smooth and faultless fabrics in a loom of a relatively small width, said fabrics obtaining a width considerably exceeding that of the loom. This was impossible to do by the methods used hitherto.

The process according to this invention, by which process it is possible to carry out the above mentioned important technical progress, is mainly characterized by the fact that two or several layers of cloth of an animal material are woven together by means of vegetable fibres, serving to keep together the layers of cloth during the manufacture, i. e. only during the weaving or during the weaving as well as during the dressing, but which fibres are carbonized before, during or after the dressing of the woven fabric.

The process according to this invention carried out in the manufacture of different woven fabrics is schematically illustrated in Figures 1 to 11 of the accompanying drawing.

In Figure 1 *a* and *b* indicate two layers of cloth of an animal material, which layers of cloth have been woven together by means of a vegetable fibre *c* which may be either a warp or weft thread. During the weaving the vegetable fibre prevents all gliding of the layers of cloth, thus making it possible to produce an entirely smooth and faultless woven fabric.

When the layers of cloth *a* and *b* have been ready-woven the same may for instance be subjected to fulling before the connecting fibre *c* is carbonized and first after the fulling the fibre *c* is carbonized, after which the now separate layers of cloth are subjected to a continued dressing if desired.

In Figure 2 *a*, *b*, and *d* indicate three layers of cloth of an animal material, all the three layers of cloth having been woven together by means of a vegetable fibre *c* which may be either a warp or weft thread.

In manufacturing woven fabrics in four layers, either all the layers may be woven together by means of a binding vegetable warp or weft thread as shown in Fig. 3^A or a weft thread as shown in

Fig. 3^B. The layers of cloth may also be woven together in pairs as shown in Fig. 3 by warp or weft threads. In the last mentioned figure *a*, *b*, *d* and *e* indicate four layers of cloth of an animal material, of which layers of cloth *a* and *b* have been woven together by means of a vegetable fibre *c* and the layers of cloth *d* and *e* by another vegetable fibre *c*¹. By weaving together the different layers of cloth in this manner the layers of cloth *a* and *b*, when ready-woven, may be separated from the layers of cloth *d* and *e* and the two layers be dressed each for themselves.

Moreover according to this invention two or several layers of cloth of an animal material may be woven as fabrics which are folded one or several times along the longitudinal direction of the warp, whereby two or several layers, adjacent to each other, are woven together by vegetable fibres which are carbonized before, during or after the dressing of the woven fabric, and before or after the layers of cloth having been spread out in their whole width.

Just this last mentioned process makes it possible to obtain smooth, faultless woven fabrics of a considerably larger width than that of the loom.

In the showing in Figs. 1, 2, 3 and 3^A, the vegetable binding threads may be either warp or weft threads, whereas in Figs. 3^B and 4 to 11, the vegetable binding threads are shown as weft threads. Of course, it is obvious that the vegetable binding thread may be run in any desired direction.

In Figure 4 two layers of an animal material are thus shown and indicated by *a*, which layers of cloth have been woven as a fabric folded one time along the longitudinal direction of the warp. The vegetable connecting fibre is indicated by *c*. The fibre *c* is carbonized before, during or after the dressing, and before or after the woven fabric has been spread out in its entire width.

In Figure 5 are shown four layers of cloth *a*, *b* of an animal material said layers being woven as two fabrics, and each of which being folded one time along the longitudinal direction of the warp. The layers of cloth are connected by means of a vegetable fibre *c*. As is clear from the figure of the drawing the fibre *c* connects only the two layers adjacent to each other, on account of which the fabric, when ready-woven, may be spread out in its entire width, in order hereafter to be fulled or to be subjected to the carbonizing process before this first-mentioned process takes place.

Instead of having the vegetable fibre *c* to connect only the two adjacent layers, the said fibre may be brought to connect at the same time, as

a binding thread of the warf all the four layers of the two fabrics.

In Figure 6 are shown six layers of cloth *a*, *b*, and *d* of an animal material, said layers of cloth being woven as three fabrics and each of which being folded one time along the longitudinal direction of the warp, and of which fabrics the one, which is indicated by *a*, is woven in such a manner that the same is located inside the other fabric, which is indicated by *b*, and surrounded by same. In order to connect the layers of cloth, three vegetable fibres are used, which are indicated by *c*, *c*¹ and *c*².

In Figure 7 are shown three layers of cloth *a* of an animal material, which layers of cloth are woven as a fabric folded two times along the longitudinal direction of the warp. The layers of cloth are connected with each other by means of a vegetable fibre *c*.

In Figure 8 the invention is shown carried out in weaving in two layers, whereby the weft or shots of two layers of cloth indicated by *a* and *b* are formed by a continuous thread, alternately passing thru the warp of one layer and the one of the other, so that a continuous round-woven fabric is obtained. *c* indicates the vegetable fibre connecting the two layers.

On manufacturing round-woven fabrics according to the process as described above, the round-woven fabric may be dressed as well in longitudinal as round webs. In the first-mentioned case the vegetable connecting fibre *c* is not carbonized before the dressing has taken place and in the last-mentioned case the fibre *c* is carbonized when the round-woven fabric has been ready-woven, after which the dressing begins.

In a similar way as single fabrics may be woven as woven fabrics folded one or several times along the longitudinal direction of the warp, also round-woven fabrics may be woven as round-woven fabrics folded one or several times along the longitudinal direction of the warp.

Two examples illustrating this fact are shown in Figs. 9 and 10, whereby *a* of Figure 9 indicates the round-woven fabric made from an animal material and folded together one time along the longitudinal direction of the warp, and *c* the vegetable connecting fibre. In Figure 9 *a* indicates the round-woven fabric two times folded along the longitudinal direction of the warp and produced from an animal material, and *c*, *c*¹ and *c*² indicate the three vegetable fibres serving to connect the layers of cloth in Fig. 10.

Instead of disposing the vegetable fibre *c* and the vegetable fibres respectively in the manner as is clear from Figures 9 and 10 the vegetable fibre may be disposed as a binding thread of the warp.

In producing the fabric in two layers for the manufacture for instance of felting the outward turned sides of the two layers of cloth are napped prior to the carbonizing process. In this case the two layers of cloth may have been produced in the way as described in connection with Figures 1, 3, 4, 5, 6, 8, 9 and 10. Due to the fact that the vegetable fibre connects the two layers of cloth and prevents gliding, thus two layers of cloth may be napped simultaneously according to this invention.

By the present invention the manufacture of sacks and the like may be simplified very considerably. When manufacturing sacks and the like one proceeds in the following way according to the invention:

Two layers of cloth of animal material are woven together at their edges, except those edges

intended to form the opening of the sack, by means of animal fibres and for the rest by means of vegetable fibres which are subsequently carbonized.

The process set forth above is illustrated in Figure 11, in which *a* and *b* indicate the two layers of cloth of animal material which at the edges indicated by 1, 2 and 3 are woven together by means of animal fibres. The edges of the layers of cloth indicated by 4, which are to form the opening of the sack, are woven together by means of a vegetable fibre. The rest of the layers of cloth are woven together by means of a great or small number of vegetable fibres *c*. The fibres *c* having been carbonized the layers of cloth will form a sack, said layers being woven together at the edges 1, 2 and 3 by means of animal fibres.

In the manufacture of sleeping bags, which may also be used as fells for motor cars, the above mentioned method may be most advantageously employed. Hereby one proceeds in the same manner, as described above, with the difference that the sides of the two layers of cloth, turned outwards, are napped before the carbonizing process, after which process the inside of the sack formed is intended to be turned out. Hereafter trimming and ready-making takes place.

Several different embodiments beyond these described above and shown in the drawing may of course be thought of within the scope of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A process of manufacturing woven fabrics, comprising weaving several layers of cloth of animal fiber threads, weaving the layers of cloth together with threads of vegetable fiber passing through the layers to keep the layers together during manufacture, and subsequently carbonizing the vegetable fibers to separate the layers of cloth.

2. A process of manufacturing woven fabrics, comprising weaving several layers of cloth of animal fiber threads folded along the longitudinal direction of the warp, weaving the folded layers of cloth together by passing threads of vegetable fiber through the several layers to hold the layers together, and subsequently carbonizing the vegetable fibers to separate the layers.

3. A process of manufacturing woven fabrics, comprising weaving two layers of cloth of animal fiber threads, passing a continuous weft thread of animal fiber alternately through the warp of one layer and the other so that a continuous round woven fabric is obtained, weaving the layers of cloth together with threads of vegetable fiber passing through the layers to keep the layers together during manufacture, and subsequently carbonizing the vegetable fibers to separate the layers of cloth.

4. A process as set forth in claim 3, in which the round woven fabric is woven folded together along the longitudinal direction of the warp and in which several layers of the folded fabric located adjacent to each other are simultaneously woven together by threads of vegetable fibers which are subsequently carbonized.

5. A process as set forth in claim 1, in which, on making woven fabrics in two layers, the two sides of the layers of cloth turned outwards are napped before the carbonizing procedure.

6. A process as set forth in claim 1 for the manufacture of sacks, in which two layers of cloth of animal fiber threads are woven together

at the edges thereof to be joined as closed portions of the sack by animal fiber threads, the edges of the cloth forming the open side of the sack being woven together by threads of vegetable fiber which are subsequently carbonized. 80

5 7. A process as set forth in claim 1 for the manufacture of sacks, in which two layers of cloth of animal fiber threads are woven together at the edges thereof to be joined as closed portions of the sack by animal fiber threads, the edges of the cloth forming the open side of the sack being woven together by threads of vegetable fiber which are subsequently carbonized, and in which the two exterior surfaces of the cloths forming the sack are napped before the vegetable fiber threads are carbonized, after which the sack is turned inside out to place the napped surface on the interior. 85

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