

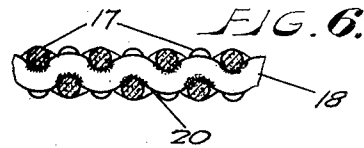
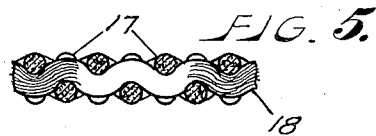
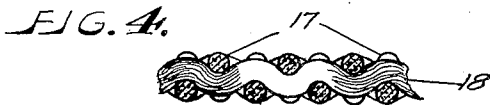
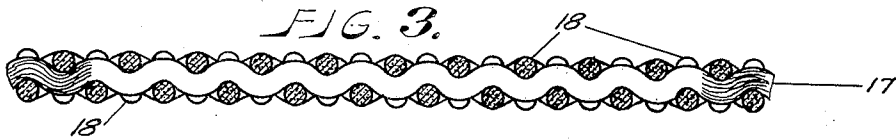
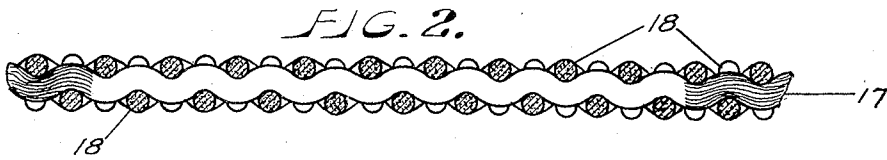
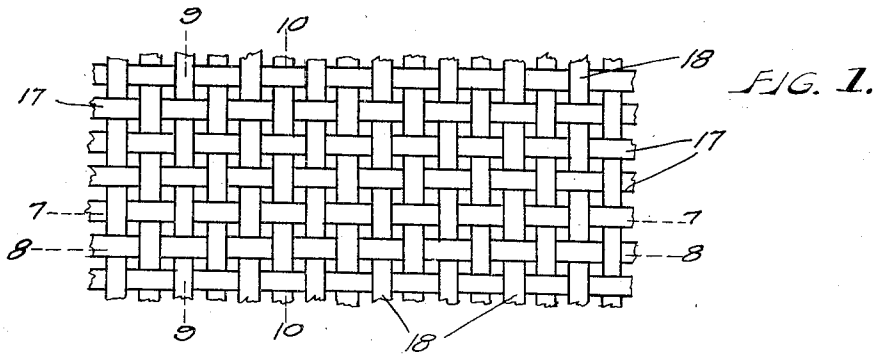
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B. H. DIVINE

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BUFFING WHEEL CLOTH AND PROCESS OF MAKING THE SAME

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UNITED STATES PATENT OFFICE

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BUFFING-WHEEL CLOTH AND PROCESS OF MAKING THE SAME

Application filed August 31, 1928. Serial No. 303,239.

My present invention relates to buffing-wheel cloth and the process of manufacturing the same.

The purpose of this invention is to provide a new and improved buffing-wheel cloth which is especially fitted for the purposes and uses of a buffing-wheel and adapted to resist to much greater extent than heretofore the tendency to unravel, and further to provide a process or processes for manufacturing the same.

In buffing-wheels, disks of cloth or pieces of cloth arranged in disks are used with the edges of the disks exposed at the periphery of the wheel to carry the abrasive or buffing material.

A further purpose of this invention is to point out a process whereby both the filling threads and the warp will be provided with sizing material and the whole mass of the fabric cemented together where the threads cross but without filling up the interstices between parallel threads or threads spaced apart; and further to provide a process where the sizing is carried into the material before weaving by placing the size in the warp threads before weaving and then distributing or transferring some of this sizing to the filling threads after weaving by treating the woven cloth with moisture.

Another purpose of this invention is to provide a cloth which is made by reducing or releasing the tension of the warp threads and wherein the warp threads will have an appreciable wavy outline preferably about equalling the wavy form heretofore given only to the filling threads.

It is a further purpose of my invention to produce a cloth especially adapted for buffing wheels wherein a size is imparted to the filling threads from the warp threads after weaving and wherein the tension during weaving upon the warp threads has been greatly reduced which two features combine to produce a thicker and stronger cloth due to the wavy formation of the warp threads tending to more thoroughly diffuse the sizing into the filling and cement the whole mass of the fabric together.

A further purpose is to provide a process

which combines said features of imparting size to the filling threads and reducing the tension upon the warp threads.

Fig. 1 is a plan view on an enlarged scale of a piece of fabric embodying my present invention and illustrating the process used in the manufacture thereof.

Figs. 2 and 3 are longitudinal sectional views on lines 7-7 and 8-8 respectively of Fig. 1.

Figs. 4 and 5 are transverse sectional views on lines 9-9 and 10-10 respectively of Fig. 1.

Fig. 6 is a sectional view similar to Figs. 2 to 5, diagrammatically showing the sizing in my cloth at the contacting points or surfaces only of the intersecting warp and filling threads.

Figs. 1 to 5 show cotton cloth as woven pursuant to this invention. As seen in Figs. 4 and 5 the filling threads 18 have the same wavy formation as usually found in the filling threads of the plain cloth, but in cloth made according to this invention as particularly shown in Figs. 2 and 3 it will be seen that the warp threads 17 also have been given a wavy formation in the weaving similar to that present in the filling thread 18 of this fabric.

This wavy formation of the warp thread 17 is produced through releasing or greatly reducing the tension upon the whole series of warp threads during the weaving operation so that as the cloth is pressed together after each filling thread is put in place the said warp threads are allowed to be taken up in the weaving and forced into the wavy or undulating shape as shown in Figs. 2 and 3. The loosening of the tension of the warp produces a rough and unfinished looking cloth. I have found, however, that cloth so produced is thicker than cloth produced by the ordinary tension being maintained upon the warp threads and also that the cloth so made when the tension is reduced is very much more efficient as a buffing wheel cloth. This efficiency shows itself in that such cloth resists for a much greater length of time the tendency to unravel or fray out at the raw edges presented in a buffing wheel

when under the strain of work. I attribute this increased efficiency to the fact that the warp threads have been given a wavy formation so that the cloth is as strong longitudinally as it is transversely. In cloth as formerly made and used in buffing wheels there was very little strength in the cloth to resist unraveling lengthwise and as each layer of cloth had two lengthwise edges exposed to wear, the buffing wheel had its length of life determined by its weakest edges. In other words, each piece of cloth would unravel at its two edges where unraveling was the easiest and its strength on the other edges was of no special consequence.

In cloth made pursuant to this invention I have maintained the strength transversely of the cloth and have brought the strength longitudinally of the cloth up to the same standard. In other words, the wheels now have their extent of life determined by two pairs of strong edges and with these two pairs of edges substantially equal in strength and in fact with both of these edges as strong as the strongest edge heretofore in cotton cloth.

The importance of this eliminating the weak edges heretofore present in buffing wheel cotton cloth can hardly be over-estimated in this art. The buffing wheel with its great number of disks of cloth on edge is simply a means or vehicle for bringing buffing abrasive material against metals being buffed. Even when cloth is used in clothing or fabrics with very moderate amount of wear raw edges are never exposed to wear but the edges are turned over to prevent unraveling. In a buffing wheel just the reverse is the practice in that only the raw edges of the cloth are exposed to wear. These edges cannot be reinforced or turned in to prevent unraveling and the wear is increased many times through the cloth being exposed to constant contact with metal. This contact necessarily has worn down very rapidly the types of cloth heretofore used or available for buffing wheels. In the cloth embodying my invention the shaping of the warp threads into the wavy form has interlocked and interwoven the cloth against unraveling and so renders the cloth many times more efficient in resisting the unraveling tendency.

Heretofore in types of cloths used for buffing wheels only the warp thread has been strengthened by the sizing. This small amount of sizing, say five per cent by weight of the warp has been added to strengthen the warp thread during the weaving operation. No sizing, however, has been imparted to the filling threads. For the ordinary purposes of cotton cloth the absence of sizing in the filling threads was of no special consequence. When such plain cotton cloth, however, was used in a buffing wheel the absence of sizing in the filling threads allowed the filling

threads to disintegrate much more rapidly than the warp threads. The sizing imparted to the warp tended to bind closely together all the fibers of cotton in the warp and operated to an extent like a waxed thread to present the whole strength of the thread against any disintegrating force. I have found that if the filling threads could be also impregnated with sizing the cloth so produced resists the disintegration of wear very much longer. The reason for this is doubtless that the placing of sizing in the filling threads gives the filling threads the benefit of having their fibers of cotton closely bound together. There is an inherent difficulty, however, in impregnating the filling threads with sizing before weaving in that the sizing of the filling threads would stiffen them so much that they would not weave readily, but would kink or twist and cause great trouble in the weaving.

I have overcome this difficulty by placing in the warp threads before weaving an excess of sizing and then weaving these excessively sized warp threads into the cloth with unsized or only slightly sized filling threads and after the fabric is so woven subjecting the whole fabric to a treatment of moisture of such extent, duration and character that the sizing in the warp threads is softened and some of it becomes transferred to the adjacent filling threads by being transferred across the immediately contacting faces of the warp and filling threads. In this way the filling threads become sized and strengthened through the addition to said filling threads of the sizing which binds the fibers of cotton in the filling threads together. Furthermore, such transfer of the sizing from the warp to the filling threads leaves a small amount of sizing upon the immediately contacting faces of the warp and filling threads which sizing operates to cement together the warp and the filling threads at such immediately contacting surfaces.

The moisture treatment to which my cloth is subjected, however, is very carefully arranged as to extent of moisture provided and the amount thereof allowed to be absorbed by the woven cloth so that only enough moisture is given the cloth to allow the size in the warp to become softened sufficiently so that some of the size will travel across the contacting surfaces from the warp to the filling threads. Sufficient size is thus transferred mostly by capillary attraction to add the desired strength to the filling threads but without filling up the interstices between approaching threads or between parallel warp threads or between parallel filling threads. The transferring of the size from the warp to the filling threads without filling up said interstices leaves the cloth still soft and pliable and particularly leaves the cloth interstices open for ventilation purposes.

In Fig. 6 I have shown really diagrammat-

ically the path of travel of the size 20 from the warp to the filling threads and particularly I have shown that only a little size remains between the immediately contacting surfaces of the warp and the filling threads and that the size has not been flooded out into the other interstices of the fabric such as where the warp threads approach the filling threads or where the warp threads are parallel or where the filling threads are parallel. This special transfer of the size by the limited moisture treatment of the cloth is to be clearly distinguished from a soaking or saturation of the cloth with such a generous supply of moisture that the size would be carried out into the interstices of the fabric.

My process and the cloth I obtain are also to be distinguished from the process and cloth resulting therefrom where the size is added to the cloth after weaving as by dipping the cloth in size or spraying or otherwise applying the size to the cloth.

The two features of my cloth now disclosed will be seen to have an interrelation or cooperative relation. Allowing the warp threads to be woven with a reduced tension, resulting in the wavy formation, gives a much greater surface in intimate contact between the warp threads and the filling threads so that more of the sizing can be transferred to the filling threads and so that more sizing will remain in the intimately contacting surfaces between the crossing filling threads and the warp threads and still leave the previously open interstices still open. On the other hand, the moistening of the completed fabric and the transferring of some of the sizing to the filling threads and the subsequent drying of the fabric tends to give a more permanent set to the wavy formation of the warp threads than would be the case if the tension upon the warp was reduced but the sizing transfer step eliminated.

It will now be seen that I am taking these new processes and providing these new means for producing a buffing wheel cloth that has increased strength and greater efficiency as a buffing wheel cloth by making its strength and structure as nearly equal as possible both lengthwise and transversely of the fabric. To that end the cloth I produce will also preferably utilize the heretofore known but often ignored other means or methods tending to make the cloth of equal strength and durability in both directions, which means or methods include having the warp and filling threads of the same size, having the warp and filling threads of the same count—viz—threads to the inch—and having the warp and filling threads of the same twist.

What I claim as new and desire to secure by Letters Patent is:

1. The process of manufacturing buffing wheel cotton cloth which consists in supplying the warp with sizing material before

weaving, weaving unsized filling threads and said sized warp into cloth, with the weaving tension on the warp low enough relative to the tension on the filling threads to make the warp threads bend appreciably at the crossing points of said warp and filling threads and moistening the woven cloth whereby the size in the warp is partly transferred to the filling and the fibers of the filling threads are bound together.

2. The process of manufacturing buffing wheel cotton cloth which consists in supplying the warp with sizing material before weaving, weaving unsized filling threads and said sized warp into cloth, with the weaving tension on the warp low enough relative to the tension on the filling threads to make the warp threads bend about equally with the filling threads at the crossing points of said warp and filling threads, and moistening the woven cloth whereby the size in the warp is partly transferred to the filling and the fibers of the filling threads are bound together and the bent warp and filling threads are cemented together.

3. The process of manufacturing buffing wheel cotton cloth which consists in supplying the warp with an excess of sizing material before weaving, weaving unsized filling threads and said sized warp into cloth, with the weaving tension on the warp low enough relative to the tension on the filling threads to make the warp threads bend appreciably at the crossing points of said warp and filling threads, and moistening the woven cloth whereby the size in the warp is partly transferred to the filling and the filaments of the filling threads are bound together and the bent warp and filling threads are cemented together.

In witness whereof I have affixed my signature, this 28th day of July, 1928.

BRADFORD H. DIVINE.