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2,642,706

BIAS SISAL BUFF

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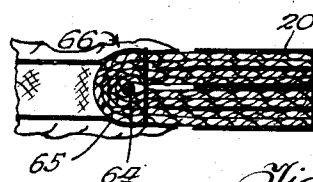
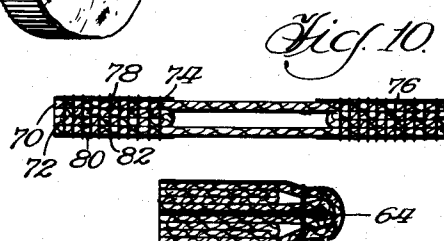
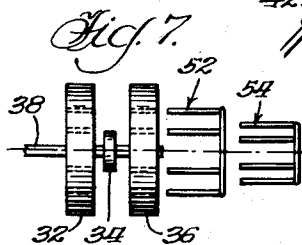
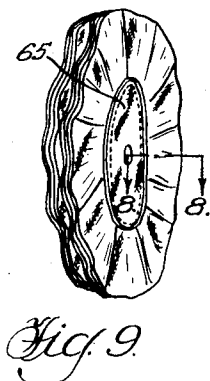
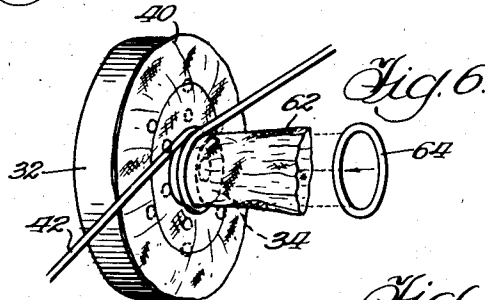
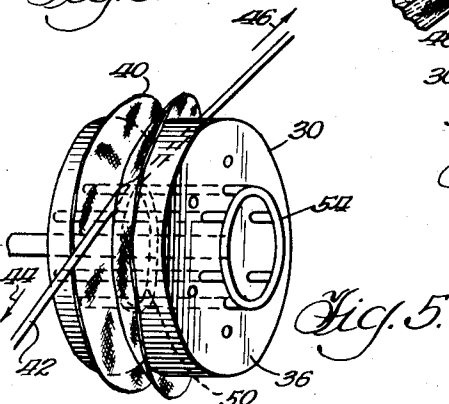
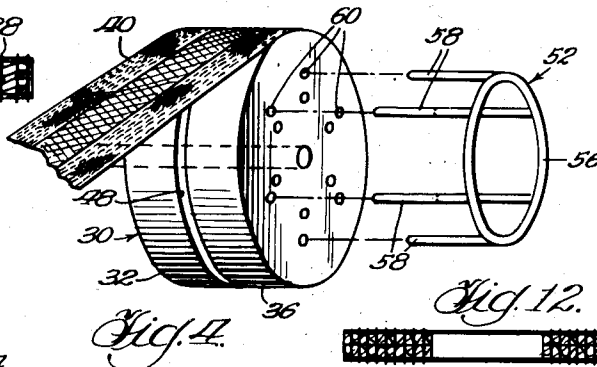
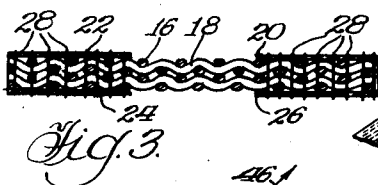
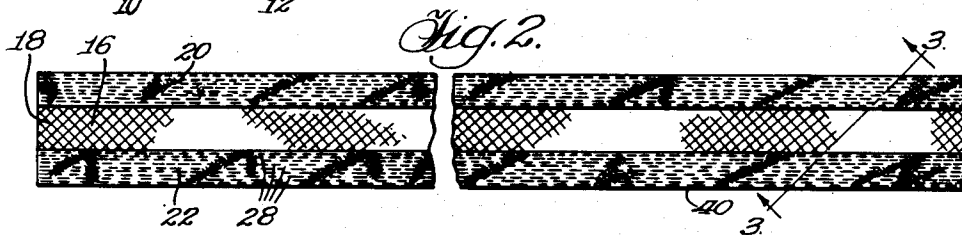


Fig. 11. INVENTOR.
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UNITED STATES PATENT OFFICE

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BIAS SISAL BUFF

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12 Claims. (Cl. 51—193)

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This invention relates to a bias burlap buff and to a method of making it. There is also disclosed a machine for making a bias buff.

A bias buff is one in which the threads forming the woof and the warp of the fabric sheets intercept the entire circular peripheral edge at acute angles, approximately 45 degrees. One type of bias buff is made by wrapping a strip of cloth around a cylindrical drum having a central, annular deep channel. When the desired number of layers of cloth have been wrapped around the drum and spanning the channel, a wire is wrapped around the layers adjacent the channel. The wire is then tightened so as to draw the cloth into the channel and thereby turn its surfaces at substantially right angles. The tightening wire is replaced by a ring and stitching holds the elements in permanent assembled relationship. Near the hub, the cloth is, of course, gathered in folds and these folds diminish as the periphery is approached. In these buffs, the layers of fabric are not stitched to each other excepting at the center where they are fastened to a cardboard hub. The cloth is quite flappy. The advantage of this bias buff over the buffs in which the layers of fabric are flat resides not only in the fact that the buff has longer life because the yarn is less easily unraveled, but also because the gatherings of the cloth provide better ventilation and reduce overheating. Also, all strands pass underneath the retaining ring and are held permanently in the buff.

Applicant has specialized in the manufacture of buffs employing a plurality of fabric layers in conjunction with a plurality of much coarser layers of burlap in accordance with his United States Patent No. 2,134,676. The burlap may be made of sisal, a product of Caribbean countries, or of jute from the East Indies, and less commonly of hemp. Fibers from these products are much tougher and have more structural strength than does cotton or flax. They have a longer life because they seem to be able to resist the action of the buffing compound which, of course, acts not only on the metal to be worked but upon the buff that carries it. Woven sisal and jute are commonly available in the woven, fabric form used for burlap bags. In this form, the threads of either the woof or the warp vary from a circular cross section to a flat cross section, the former having a diameter of perhaps one-sixteenth of an inch and the latter having a width of as much as three-sixteenths of an inch.

The general object of this invention is to make a bias sisal buff. The bias sisal buff will have the

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same advantages over an ordinary sisal buff that a bias cloth buff has over an ordinary buff—and it will have one more advantage. In the ordinary sisal buff, particularly where a plurality of them are made up into a wheel, the peripheral density of the sisal fibers is not consistent transversely of the buffing surface. Thus, assuming a wheel two inches long, made up of a plurality of buffs one-fourth inch thick, no matter how hard the buffs are pressed together from the sides, the stitching and the muslin layers, which mark the outer wall of each buff, creates a circumferential line where the sisal density is low. Along each of these lines, that is, the space between each of the buffs, the buffing compound will be held differently from the way it is held where the sisal fibers are more dense, and fewer of the sisal fibers will engage the work. Where the wheel and the piece being worked have a cylindrical surface, streaking may be avoided by moving either the wheel or the buff axially of the other, but where the work has a non-cylindrical shape and the buff has been cut to conform to that shape, such axial movements are impossible and streaking occurs. The sisal layers in the bias sisal buff, even when several are combined, do not lie in planes normal to the buff's axis but are wavy due to the folds or pleats, with the result that the bias sisal buff is able to finish an article without streaks and irrespective of the article's shape.

The first specific object of this invention is to provide a bias sisal buff in which the woven sisal will not unravel during use. The bias muslin buff is so closely woven that the threads are not separated by centrifugal force. Sisal, on the other hand, is so loosely woven that centrifugal force will separate the woof from the warp so that the periphery of the buff becomes a mass of loose strands that will not hold or properly apply buffing compound. Applicant attains this end by transversely stitching the sisal layers commencing at the perimeter and working inwardly, and preferably stitching the sisal layers between muslin layers. The muslin is important not only for providing a superior base for the stitching, but because it tends to keep the stitching from unraveling as the cutting at the circumference works inwardly and progressively cuts stitches.

These and such other objects as may hereinafter appear are attained in the embodiments of the invention shown in the accompanying drawings wherein:

Fig. 1 is a face view of a strip of woven sisal fabric cut on the bias;

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Fig. 2 is a face view of a bias sisal swatch having several layers of woven sisal cut on the bias with edge strips of muslin sewed thereto;

Fig. 3 is a view taken on the line 3—3 of Fig. 2;

Fig. 4 is a perspective view, somewhat schematic and partly exploded, of applicant's improved bias buff winding drum showing a removable spider core and a bias sisal swatch being fed onto the drum;

Fig. 5 is a view showing the completion of applicant's first step in shaping a bias sisal buff;

Fig. 6 is a perspective view taken immediately prior to the insertion of the ring in the buff;

Fig. 7 is a side elevation of the two drums separated from the core with the spiders retracted;

Fig. 8 is a sectional view of a buff taken on the line 8—8 of Fig. 9;

Fig. 9 is a perspective view of a finished bias sisal buff; and,

Figs. 10 and 11 are sections of an alternative type of construction of a bias sisal buff.

Continuing to refer to the drawings, in Fig. 1, the numeral 10 identifies a swatch of woven sisal, the edges 12 and 14 being parallel and cut on the bias of the weave with the woof indicated by the numeral 16 and the warp by the numeral 18. The woven sisal that applicant uses is woven from round and flat threads with sectional dimensions varying from one thirty-second to three-sixteenths of an inch. This is a very course fabric. The number of warp and woof threads per inch being eight to ten.

Sisal is a fiber which has the botanical name of *Agav sisalina*. It is found in Caribbean countries and Java. Each thread of sisal is made up of twenty to thirty sisal strands whose cross sections vary greatly in size and shape. Sisal is commonly used in this country to make burlap bags. Hemp and jute are also tough fibers which are frequently used in burlap bags and for purposes where great strength is wanted at a minimum cost. In this specification, the word "burlap" is used to define any fabric, whether it is made of sisal, jute or hemp, or any other product, in which the threads that have been woven into the fabric are very course and in which the threads are formed of a very stiff fiber, particularly one that is little affected by water or oils, as contrasted with a cotton fiber.

Returning to Fig. 1, applicant's swatch for a buff having four circumferential courses with an outside diameter of approximately sixteen inches, is about eleven inches wide and 100 inches long. Applicant superimposes two such swatches on each other and then applies four strips of muslin 20, 22, 24 and 26, as shown in Figs. 2 and 3. These muslin panels are fastened by through stitching 28 and about three inches wide.

The muslin panels are very important. Applicant has made swatches wherein he stitched along the lines indicated in Fig. 2 but without the muslin panels. The mileage (term used in the trade to describe the life of the buff) was low. Where several buffs were mounted on a shaft to form a wheel, the stitching thread at the side of each buff was exposed to the sisal fibers of the adjacent buff, and these fibers have a cutting action which quickly severs the softer cotton thread. Where muslin panels are used, the thread of one buff is rubbed only by the thread of the muslin panel or an adjacent buff. As heretofore explained, stitching is essential in any burlap buff because coarse fiber buffs quickly unravel, that is, they cease to be woven, and the moment that occurs, the periphery of the buff

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consists of fiber ends unrelated to each other and incapable of satisfactorily holding buffing compound.

The muslin panels 20 and 22 are shown cut on the bias which is a minor feature as the muslin contributes little to the buffing.

Referring now to Fig. 4, the numeral 30 identifies a split drum which consists of drum 32, see Fig. 7, spacer core 34, and drum 36. The spacer core 34 may be permanently fastened to 32 and the drums 32 and 36 and spacer core 34 may be associated with the shaft 38 in many different ways. These elements have been employed for years in the art. The assembled swatch indicated by the numeral 40 is placed on the drum and wrapped around it. When the wrapping is completed, a wire, 42, see Fig. 5, is wrapped around the swatch 40 and is pulled in the directions 44 and 46, thereby drawing the swatch 40 along its median line into the slot 48 toward the core 34. The machine for pulling the wire 42 is not shown as it is old in the art. As the pulling progresses, it will draw the swatch 40 into a substantially flat surface at right angles to the axis of the drum 30, and of necessity this will result in pleats in the swatch which pleats are heaviest closest to the core 34.

Applicant's new method steps are employed at this point. Referring to Fig. 5, the wire 42 does not constrict evenly under the forces 44 and 46, by which is meant that the wire indicated by the dotted line 50 is not a steadily contracting circle but initially is a flattened oval which ultimately becomes a circle around the core 34. In moving from an oval to a circle, however, this wire unevenly pleats the swatch 40.

It should be understood that the steps described up to this moment of the actual forming over the drum 30 are identical with those presently used in forming a bias type muslin buff. Muslin being a great deal softer, more pliable and more flexible than sisal fiber, adjusts itself more readily to the action of the wire 42 and results in a pleating around the core 34 which is fairly even although not entirely so. However, the unevenness is not sufficient to appreciably unbalance the buff. When applicant followed this same process in making a sisal buff, the uneven pleating at the center was so pronounced that the buff was unbalanced and not usable at high speeds.

Returning now to Figs. 4 and 5, applicant provides an outer spider 52 and an inner spider 54. Each spider consists of a ring 56 from one side of which extend a plurality of prongs 58. These prongs seat in a ring of holes 60 which extend through the drum 36 across the channel or space 48 into the drum 32. When applicant has drawn the wire 42 to a point where it is tight around the prongs 58 of the spider 52, he withdraws the spider 56. This releases the portion of the swatch between the wire 42 and the prongs 58 and the partially formed pleats tend to equalize themselves. Thereupon, the wire 42 is further tightened around the smaller spider 54. When this tightening has been completed, the spider 54 is withdrawn and the wire 42 is drawn tight around the core 34.

From this point, established practice continues. The drum 36 is removed and then the right-hand side of the swatch is squeezed down as indicated at 62 so that a ring 64 may be slipped over it and over the hub 34. When this ring is in position, the tightening wire 42 is released and the right-hand side of the swatch is again flared outwardly so as to form a disk buff. Commonly in this type

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of buff, a core made of metal or cardboard is inserted where the permanent core 34 had been and is fastened to the buff by means of disk panels such as 65, see Fig. 9.

A detailed showing of the finished buff, illustrated in Fig. 9, is not believed necessary. As heretofore stated, in making the present sisal buff, applicant's original swatch has two thicknesses of sisal and it is of a length such that it will go around the drum 30 completely twice, so that after the swatch has been drawn into the shape illustrated in Fig. 9, there will be four thicknesses of buffing material wherein a thickness consists of two layers of sisal flanked on each side by a layer of muslin. The cross section is illustrated in Fig. 8.

In Figs. 10 and 11, there is illustrated an experimental structure which will serve to bring out a very important point about bias type buffs. It will be noted in Fig. 8 that all of the heavy sisal fibers pass over the ring 64, and consequently none escapes from the buff unless they slip under the ring. However, this advantage results in the heavy pleating at point 66, something that cannot be adequately appreciated from the illustration in Fig. 8. Referring to Fig. 9, if one presses all of the thicknesses at the circumference together as tightly as possible, they are about an inch thick, and in the absence of seeing such a buff, it will be realized that the thickness will be substantially greater at the ring 64 with the result that when several of these buffs are combined into a wheel, the extrathickness at the hub does not permit the desired density at the periphery. Subject to this deficiency, the construction is good. The fibers are prevented from escaping the buff by passing under the ring 64, and they are prevented from seriously changing their angular relationship to the circumferential edge of the buff by means of the muslin panels 20 and stitching.

Referring now to Fig. 10, two strips of sisal fabric 70 and 72 are spaced by folded strips of sisal fabric 74 and 76. In the manner heretofore described, panels of muslin such as 78 and 80 are stitched to the surfaces by stitching 82. Upon being assembled as heretofore described, a section of it will form the shape illustrated in cross section in Fig. 11 and it will be noted that only the two outer layers of the sisal actually go under the ring 64. The result is that substantially the same thickness of buff is provided at the surface with less sisal at the ring 64 to be crushed into pleats. This will have some advantage in those situations where a plurality of buffs are mounted on a shaft side by side and pressed together to buff some item having a substantial width.

Having thus described applicant's invention, what is claimed is:

1. A buff section comprising a flat annulus of woven material whose woof and warp threads are substantially the same in number at the inner periphery as at the outer periphery of the annulus and whose mesh are reshaped and increasingly smaller toward the inner periphery so that the woven material lies substantially flat without pleats, and means for holding the woof and warp threads in said reshaped position.

2. A buff section comprising a plurality of flat annuluses of woven material whose woof and warp threads are substantially the same in number at the inner peripheries as at the outer peripheries of the annuluses and whose mesh are reshaped and increasingly smaller toward the inner peripheries so that the woven material lies

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substantially flat without pleats, and stitches of thread through the annuluses and closely spaced from each other along the surface of the annuluses.

3. A buff section comprising a flat annulus of coarsely woven material whose woof and warp threads are substantially the same in number at the inner periphery as at the outer periphery and whose mesh are reshaped and increasingly smaller toward the inner periphery so that the woven material lies substantially flat without pleats, an annulus of more finely woven cloth registered on said first annulus, and stitches of thread through said annuluses and closely spaced from each other along the surface of the annuluses.

4. A buff section comprising a flat annulus of coarsely woven material whose woof and warp threads are substantially the same in number at the inner periphery as at the outer periphery and whose mesh are reshaped and increasingly smaller toward the inner periphery so that the woven material lies substantially flat without pleats, an annulus formed of more finely woven cloth cut on the bias of the woof and warp with the inner edge drawn in pleats and the outer edge substantially flat and registered on the more coarsely woven annulus, and closely spaced means holding the reshaped coarser woven annulus to the cloth annulus.

5. A buff section comprising a plurality of flat annuluses of coarsely woven material whose woof and warp threads are substantially the same in number at the inner peripheries as at the outer peripheries and whose mesh are reshaped and increasingly smaller toward the inner peripheries so that the woven material lies substantially flat without pleats, annuluses of cloth registered and positioned between selected annuluses of the more coarsely woven material, and stitches of thread through the annuluses and closely spaced from each other along the surfaces of the annuluses.

6. A buff section comprising a plurality of flat annuluses of burlap whose woof and warp threads are substantially the same in number at the inner peripheries as at the outer peripheries and whose mesh are reshaped and increasingly smaller toward the inner peripheries so that the burlap lies substantially flat without pleats, and stitches of thread through the annuluses and closely spaced from each other in all directions along the surfaces of the annuluses.

7. A buff section comprising a plurality of flat annuluses of burlap whose woof and warp threads are substantially the same in number at the inner peripheries as at the outer peripheries and whose mesh are reshaped and increasingly smaller toward the inner peripheries so that the burlap lies substantially flat without pleats, annuluses of cloth registered between annuluses of the coarser woven material, and stitches of thread through the annuluses and closely spaced from each other along the surfaces of the annuluses.

8. A buffing section comprising a spiral of woven material whose surfaces are substantially normal to the spiral's axis and whose woof and warp are substantially the same in number at the inner periphery as at the outer periphery of the spiral and whose mesh are reshaped and increasingly smaller toward the inner periphery so that the woven material lies substantially flat without pleats, and stitches of thread through the layers of the spiral and closely spaced from each other in a surface thereof.

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9. A buff section comprising a plurality of nesting spirals of woven material whose surfaces are substantially normal to the spiral's axis, one of said spirals being formed of reshaped coarsely woven material whose woof and warp threads are substantially the same in number at the inner periphery as at the outer periphery of the spiral and whose mesh are reshaped and increasingly smaller toward the inner periphery so that the woven material lies substantially flat without pleats, another of said spirals being formed of more finely woven cloth, and stitches of thread through the layers of the spiral along the surface thereof.

10. A buff section comprising a spiral of woven material folded outwardly along the inner periphery of the spiral with the surface substantially normal to the spiral's axis and whose woof and warp threads are substantially the same in number at the inner periphery as at the outer periphery and whose mesh are reshaped and increasingly smaller toward the inner periphery so that the woven material lies substantially flat without pleats, and stitches joining the two folded layers of the spiral.

11. A buff section comprising a spiral of coarser woven material folded outwardly along the inner periphery of the spiral with the surface substantially normal to the spiral's axis and whose woof and warp threads are substantially the same in number at the inner periphery as at the outer periphery and whose mesh are reshaped and increasingly smaller toward the inner periphery so that the woven material lies substantially flat without pleats, a spiral of more finely woven cloth nested in the first spiral, and stitches join-

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ing the cloth layer to its associated layer of coarser woven material.

12. A buff section comprising a spiral of burlap whose surface is substantially normal to the spiral's axis and whose woof and warp threads are substantially the same in number at the inner periphery as at the outer periphery and whose mesh are reshaped and increasingly smaller toward the inner periphery so that the burlap lies substantially flat without pleats, a spiral of cloth nested and registered in the spiral of burlap, and stitches of thread joining the spiral of cloth to the adjacent spiral of burlap.

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