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BUFFING WHEEL

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This invention relates to buffing wheels, and is directed to the provision of an improved buffing wheel of cloth impregnated with a nondrying lubricant fatty acid composition.

A buffing wheel comprises a plurality of layers of cloth assembled into a circular body with the plane faces of the layers arranged more or less in parallel relation, and with the periphery of the circle defined by the edges of the cloth. Buffing wheels are often built up by mounting a plurality of buffing wheel sections, each section being itself a rather thin buffing wheel, on a rotatable shaft, and securing the sections together on the shaft.

Sometimes buffing wheel sections are made by stacking together a plurality of disks of woven cloth and sewing them together. Sections made in this manner are commonly called full disk sections. In service, a substantial number of the threads of each cloth disk become unraveled and the useful life of the section is thereby shortened. Such buffs, moreover, tend to scorch easily at the surface.

Oftentimes buff sections are made with woven cloths in such ways that very little unraveling occurs. This is generally accomplished by cutting cloth strips on a bias and drawing such strips into circular form so that the bias-cut edges of the strip lie at the periphery of the circle. In buff sections of this type (known as bias buffs) the excess of cloth is gathered into folds in the central portion of the section. In the finished section, therefore, the cloths are rather loosely compacted. The bias-cut periphery of such buff sections stands up well against the work being buffed, but the loosely compacted internal portions (i. e., the portions disposed inwardly from the periphery of the section) bend or flex. This internal movement of cloth fibers in contact with one another produces a rubbing action which, in moderately severe service, wears many of the fibers through and even causes such overheating that the fibers actually become charred. Obviously the useful life of the section is thereby considerably reduced.

Because of the tendency of soft bias-cut buff sections to overheat, it has become customary in the art to mount such sections on apertured hubs, so that centrifugal force during use of the buff induces a flow of air radially through the ruffles and folds of the section. Such ventilation of the buff sections reduces the seriousness of the overheating but does not eliminate it.

We have found that if the cloth of a bias buff section is uniformly but lightly impregnated with a nondrying fatty acid composition, the tendency of the section to overheat is greatly reduced. Evidently the fatty acid acts as a lubricant between the fibers of the cloth. We have further found that buff sections thus impregnated are much more readily and quickly charged with buffing and related abrasive compositions, and that such compositions are held better by such buff sections than by conventional buff sections of untreated cloth.

Based on these findings, the invention provides an improved buffing wheel section comprising an assemblage

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of a plurality of layers of woven cloth, each of said layers being uniformly but lightly impregnated throughout its entire body with a nondrying lubricant composition comprising fatty acids. Compositions of fatty acids blended with waxes, and especially with the fatty acid ester waxes, are particularly satisfactory compositions to employ for impregnating the cloth of buff sections according to our invention.

As stated, the cloth of the buff section should be but lightly impregnated with the fatty composition. Preferably the degree of impregnation is sufficiently light so as to leave the impregnated cloth substantially dry to the touch, and (at least at normal operating temperatures) substantially as soft as corresponding untreated cloth.

While the invention is of particular value in connection with bias buffs, or other soft buffs which ordinarily tend to generate considerable heat during normal usage, it is also of advantage in connection with the more densely compacted buffs, such as those assembled from full disk sections.

The fatty acid composition used to impregnate the woven cloths should be nondrying, so that upon prolonged exposure to air it does not volatilize (evaporate), or oxidize to the point where it becomes sticky, tacky, tough, or a substantially rigid solid. If such should occur, the composition would not function as a lubricant, and further the woven cloths would then be stiffened so that they would offer considerable resistance to flexing. Such stiffening is undesirable, because it is often necessary to use buffs made in accordance with the invention to polish irregularly shaped surfaces, and in such service a high degree of flexing is necessary in order that the face of the rotating buff may be made to conform to the irregularly shaped surface. Further, the cloths should be only lightly impregnated with the fatty acid composition so that no undue stiffening of the cloth results, and so that the composition will not be expelled from the fibers when the buffing wheel section rotates at high speeds. We have found that the amount of the lubricant composition most advantageously does not exceed 25% by weight of the dry untreated fabric, and for best results is in the range from 10% to 20% by weight thereof.

Any nondrying fatty acid, or mixture of fatty acids or mixture of one or more fatty acids and waxes, can be used for treating cloths for buffs in accordance with the invention. For example, palmitic acid, stearic acid and other saturated fatty acids, mixtures thereof, and mixtures of such fatty acids with waxes are satisfactory. Of course, the use of any such fatty acids which are so volatile as to be lost from the cloth by evaporation are of little value; and unsaturated fatty acids which oxidize to form tacky or solid substances are undesirable. All such compounds are included, for purposes of this specification, in the term "drying," and are excluded from use in preparing buffs according to the invention by the specification that the fatty acid compound be "nondrying."

Especially satisfactory compositions are prepared by blending a fatty acid and a wax. While the fatty acid ester waxes are preferred even in these blends, it is also possible to use other types of waxes, such as mineral waxes (e. g. paraffin wax), either in addition to or in place of the ester wax.

The invention is not limited to the use of pure fatty acids. Instead, it contemplates the use of such nondrying fatty acid compounds as are made and sold commercially and which normally contain varying amounts of impurities. The commercial products are especially likely to contain as impurities small amounts of unsaturated fatty acids of the drying type; but if the proportions of such compounds are small enough so as not to alter the generally nondrying character of the composition as a whole, their presence in the composition is not objectionable,

Also, various additions such as volatile solvents and diluents, and small amounts of viscosity-modifying agents, surface tension modifying agents, dispersing agents, fungicides and bacteriacides, and the like, may be included in the composition provided the essential nondrying lubricant character of the composition is not altered thereby.

Following is an example of the invention: A water emulsion is prepared by intimately mixing 30% by weight of commercial double pressed stearic acid, 10% by weight of a surface active emulsifying agent, and 60% by weight of water. Woven cotton cloth of the same character as is generally used for making buffs is thoroughly soaked in the aqueous emulsion, and then excess emulsion is squeezed from the fabric. The cloth is then dried in air, advantageously in warm air. When the water has all evaporated, the fabric remains lightly but uniformly impregnated with stearic acid admixed with residual emulsifying agent.

Another example of a treating composition is prepared by intimately mixing together 40% by weight of commercial oleic acid, 2% by weight of triethanolamine, and 58% by weight of water. The triethanolamine serves both as a dispersing agent and to saponify the oleic acid to a soap, so that when cloth is impregnated with the composition and the water is evaporated, the composition is nondrying despite the unsaturated bond in the oleic acid.

An example of an advantageous wax blend composition according to the invention is made by forming an emulsion of 15% by weight of stearic acid (double pressed), 15% by weight of beeswax, and 10% by weight of emulsifying agent in 60% by weight of water. After cloth has been saturated in this emulsion and the water has been evaporated, the cloth is found to be uniformly but lightly impregnated with a blend of stearic acid and beeswax containing some residual emulsifying agent.

The impregnated cloth, prepared in accordance with any of the foregoing examples, is then cut into pieces of the desired shape, and such pieces are assembled into buffing wheel sections in the manner customary in the art.

Buffing wheels and sections prepared in accordance with the invention have been found to have a long useful service life. It appears that the fatty acid composition which impregnates the woven cloth fibers substantially abates internal wear and charring of the fibers due to flexing in use. Further, the performance of the new buffs in service is highly satisfactory. The fatty acid compositions with which the buff fabric is impregnated is chemically similar to the vehicle used in many buffing and polishing compositions to carry the abrasive. It is perhaps for this reason that we have found the break-in time for the new buffing wheel section to be very short—much shorter than for conventional buffs made of un-

treated cloth; and throughout the entire life of the section it is very easy to apply the buffing or polishing composition to the face of the section. We have also found that the impregnated woven cloths hold the composition better than buffs of untreated cloth. Both of these factors lead to increases in the ease and efficiency with which buffing operations can be carried out with the new buff sections, and result in economies in the amount of buffing composition used.

We claim:

1. A buffing wheel section comprising an assemblage of a plurality of layers of woven cloth, each of said layers of cloth being uniformly but lightly impregnated throughout its entire body with a lubricant composition free of any abrasive and including a non-drying fatty acid as an essential constituent.

2. A buffing wheel section comprising an assemblage of a plurality of layers of woven cloth, each of said cloth layers being uniformly but lightly impregnated throughout its entire body with an abrasive-free nondrying lubricant comprising a blend of a fatty acid and a wax.

3. A buffing wheel section comprising an assemblage of a plurality of layers of woven cloth, each of said layers of cloth being uniformly but lightly impregnated throughout its entire body with an abrasive-free nondrying lubricant composed essentially of a fatty acid and a fatty acid ester wax.

4. A buffing wheel section comprising a plurality of layers of bias-cut cloths drawn into circular form with their bias-cut edges at the periphery of the circle and with excess cloth in the central portion of the section gathered in folds, each of said cloths being uniformly but lightly impregnated throughout its entire body with an abrasive-free lubricant composition including a non-drying fatty acid as an essential constituent, the degree of impregnation of said cloths being sufficiently light so as to leave them substantially dry to the touch and substantially as soft, at the normal operating temperature of the buff section, as corresponding untreated cloth.

5. A buffing wheel section according to claim 4, in which the amount of the nondrying fatty composition impregnated into the cloth is less than about 25% by weight of the dry cloth prior to impregnation.

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