Dec. 13, 1932. B. H. DIVINE 1,890,502

BUFFING WHEEL

Filed Oct. 26, 1929 2 Sheets-Sheet 1

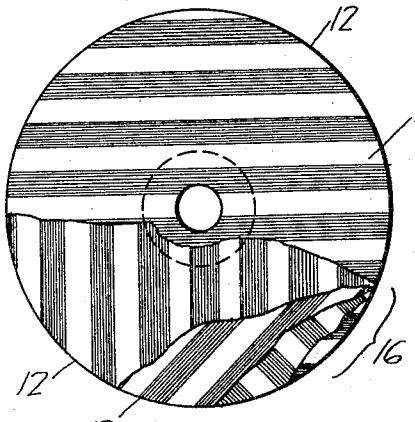


FIG. 1.

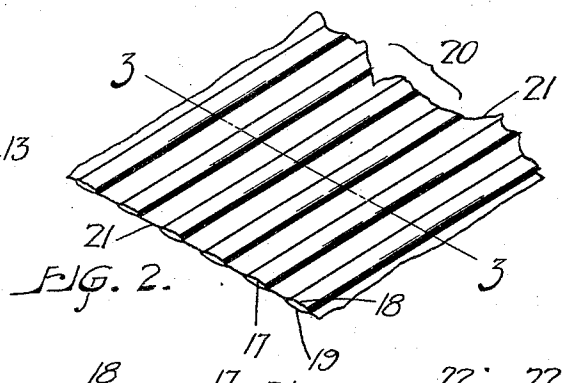


FIG. 2.

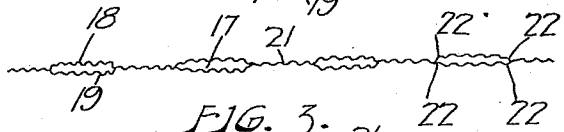


FIG. 3.

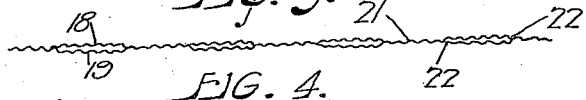


FIG. 4.

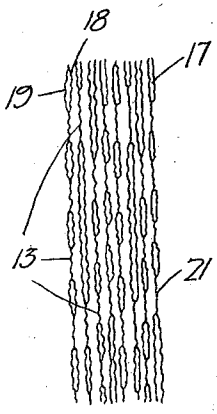


FIG. 5.

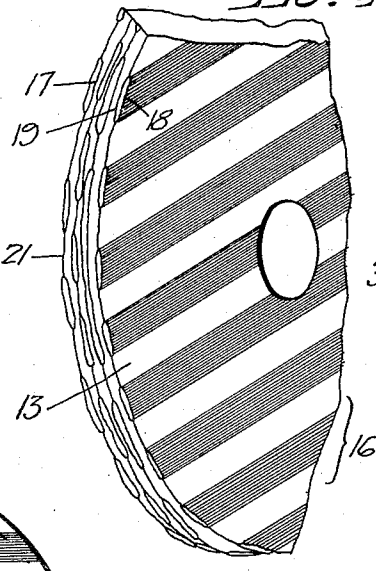


FIG. 6.

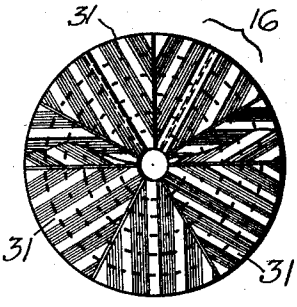


FIG. 15.

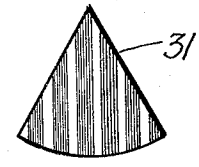


FIG. 16.

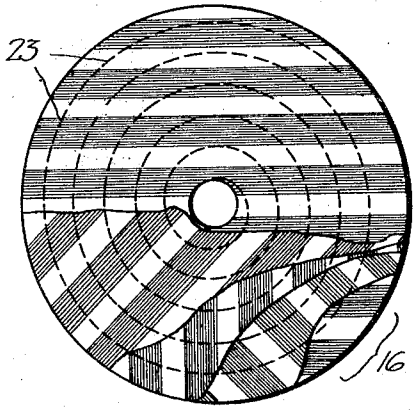


FIG. 7.

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BUFFING WHEEL

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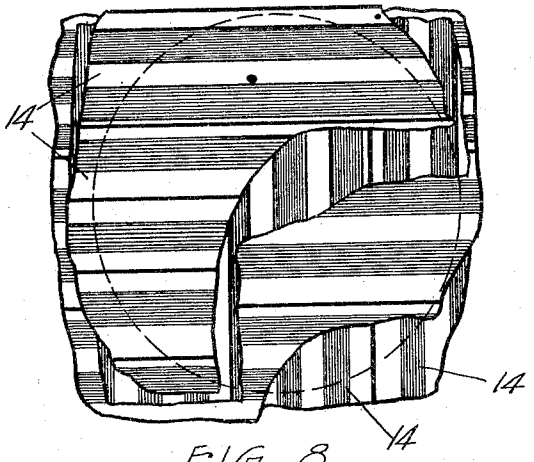


FIG. 8.

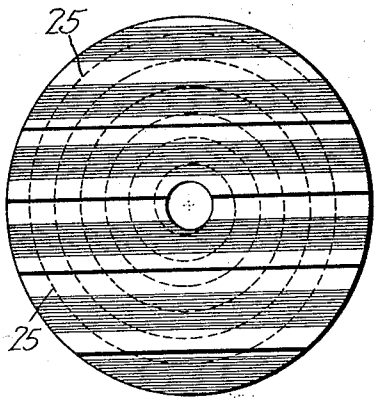


FIG. 9.

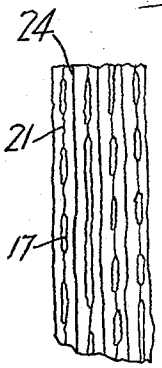


FIG. 10.

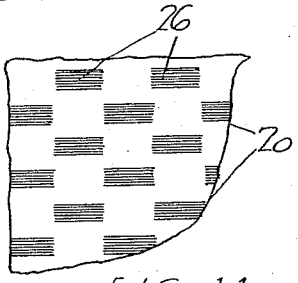


FIG. 11.

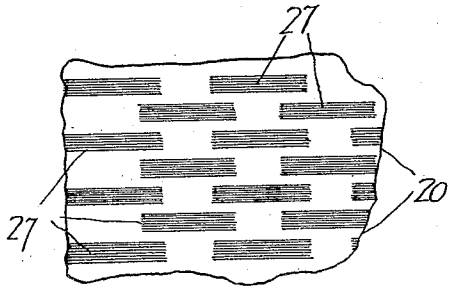


FIG. 12.

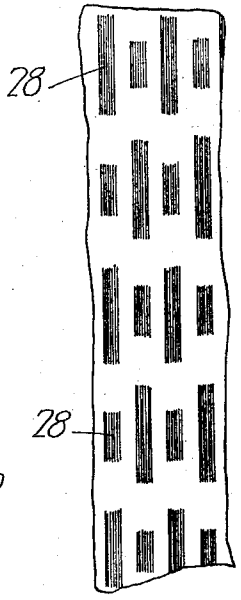


FIG. 13.

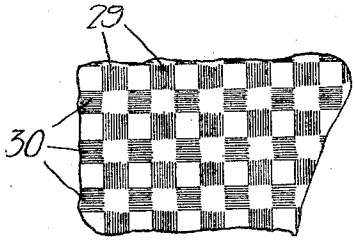


FIG. 14.

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Patented Dec. 13, 1932

1,890,502

UNITED STATES PATENT OFFICE

BRADFORD H. DIVINE, OF UTICA, NEW YORK

BUFFING WHEEL

Application filed October 26, 1929. Serial No. 402,765.

My present invention relates to buffing wheels.

The purpose of my present invention is to provide a new and improved construction of buffing wheels which construction is economical in the material used and in the assembling thereof and which is especially well adapted to receive and retain the buffing composition usually applied to such wheels so that a much greater operating efficiency and economy is attained.

The specific purpose of my invention is to provide buffing wheels wherein part or all of the disk-like layers of fabric or cloth used to form the wheel are of fabric provided with integrally formed or integrally woven pockets or tubes made by said fabric being woven or otherwise formed to have over part of its area two or more separate thicknesses.

A further purpose is to provide a buffing wheel of such construction that the said advantages may be obtained both in buffing wheels made entirely or in part of whole disk-shaped layers of fabric and entirely or in part of strips of fabric arranged to form such disk shaped layers; and furthermore to provide a construction that will provide adequate pockets to receive and retain the buffing composition even in a buffing wheel where the different layers of fabric are not sewed together towards or adjacent its periphery.

Fig. 1 is a plan view of a buffing wheel embodying one form of my invention, parts of several successive layers of the fabric being cut away to more clearly show the construction.

Fig. 2 is a perspective view of a piece of one form of fabric that may be used to form buffing wheels embodying this invention and such as is shown in Fig. 1, the pockets being shown distended in order to show the structure of the fabric.

Fig. 3 is a sectional view on line 3—3 of Fig. 2.

Fig. 4 is a similar longitudinal sectional view of the fabric but with the pockets more nearly closed.

Fig. 5 is a diagrammatic view of a part of the buffing wheel shown in Fig. 1, that is with the layers of fabric shown separated and with the pockets in the layers shown distended in order to more clearly show the construction and operation of the buffing wheels embodying this invention.

Fig. 6 is a perspective diagrammatic view on an enlarged scale of a part of the buffing wheel shown in Fig. 1.

Fig. 7 is a view similar to Fig. 1 of a sewed buffing wheel formed out of whole disk-shaped pieces of fabric, showing another embodiment of my invention.

Fig. 8 is a plan view of the layers of fabric assembled to make a wheel where the layers are formed of strips of fabric instead of whole disk-shaped pieces, parts of several layers being broken away to more clearly show the construction.

Fig. 9 is a plan view of the wheel formed by the parts shown in Fig. 8 after said wheel has been sewed and trimmed.

Fig. 10 is a diagrammatic edge view of another modification of this invention.

Figs. 11, 12, 13 and 14 are plan views more or less diagrammatic of differed forms of cloth with varying arrangements of the parts having the double thicknesses and so of the integral pockets and adapted to be used to form buffing wheels embodying my invention.

Fig. 15 is a plan view of another form of buffing wheel embodying my invention and Fig. 16 is a plan view of one of the angular shaped pieces that may be used to build up the wheel shown in Fig. 15.

Referring to the drawings in a more particular description it will be seen that this invention relates to the general type of buffing wheels wherein a plurality of disk-shaped layers 12 of fabric are arranged face to face with the edges of the disks exposed at the periphery to receive and carry the buffing composition. My invention further relates to such buffing wheels whether the said layers 12 be composed of whole disk-shaped pieces 13 of fabric or of pieces or of strips 14 of fabric arranged to form a disk-shaped layer 12 or of any combination or arrangement of such pieced disks or whole disks.

The buffing composition used upon such wheels generally consists of a mixture of a

wax-like vehicle and the buffing or abrasive material itself. Such a buffing composition is applied in any desired way to the periphery of a buffing wheel 16. The common practice is to press a stick or mass of such composition against the periphery of the rotated wheel whereby the friction of contact with the heat generated thereby will soften the wax-like part of such composition sufficiently to soften the mass of such composition and allow a layer of desired thickness to be transferred to the periphery of the wheel. In such transfer the composition is pressed to a greater or less extent into the body of the wheel, that is some of the softened composition will be taken a short distance into the edge of the fabric and some of the composition will be taken into the space between adjoining layers of the fabric and adhere to the opposing faces of such layers.

The general efficiency of this class of buffing wheels depends upon the ability of the wheel to take a fair supply of buffing composition and to retain the same upon the work-periphery of the wheel for a considerable space of time and particularly for the wheel to hold a load of such composition against the first period of working contact. In many cases heretofore, a considerable part of the composition would be removed or dropped from the wheel in the first period of working contact because the composition was not sufficiently imbedded in or held within the periphery of the wheel. Various attempts have been made heretofore to provide recesses or pockets within the mass of the wheel to afford lodgment for the composition, such recesses heretofore having been commonly made by folding the cloth or fabric upon itself to form pockets or by sewing the layers of a wheel or section of a wheel together at more or less closely spaced intervals in order to form pockets or recesses to hold the buffing composition. Such ways of providing recesses or pockets have the disadvantages that they are costly in original manufacture or only temporarily effective and depend too much upon the strength of the connecting stitches to maintain the pockets.

In buffing wheels embodying my invention I provide pockets or recesses in a buffing wheel in a new manner and without relying upon folding the cloth or specially arranging the cloth or sewing the different layers together to complete or form the pockets and particularly I provide a buffing wheel wherein some or all of the layers 12 of fabric or cloth are provided with integrally formed or integrally woven pockets 17.

Figs. 2, 3 and 4 illustrate one form of fabric so provided with such integrally formed or woven pockets 17. In this fabric the weaving or other fabricating of the fabric is such as to provide places or portions in the cloth having two separate thicknesses as 18 and 19 at the top and bottom respectively of said cloth 20 with said separate thicknesses united to each other and to the body of the cloth by the remaining part 21 of the cloth being of the usual single thickness. In the type of cloth shown in Fig. 2 these spaced portions of double thicknesses are obtained by having one series of threads, say the warp threads, separated into two parts and continuing to supply separate threads of filling to each of said separated parts of the warp so that for a time the two thicknesses 18 and 19 of said cloth are separately woven. After the desired extent of such double weaving has taken place the separated groups of warp threads are brought together in one series as usual to make plain fabric.

In the cloth shown in Figs. 2, 3 and 4 and used in the buffing wheels illustrated in Figs. 1, 5 and 6 the parts having the double thicknesses 18 and 19 are relatively regularly arranged and extend across the pieces of cloth used with the successive double thickness parts parallel and spaced from each other so that the width of the single thickness portions 21 is about the same as the width of the parts of the cloth having the double thicknesses. It will be understood, however, that this particular construction of cloth is merely illustrative of a good form of my invention and that my invention is not limited to the use of cloth or fabric having double thicknesses arranged in the precise form illustrated.

In the buffing wheel shown in Figs. 1, 5 and 6 the whole disk-shaped pieces 13 are arranged so that the double thickness portions 18 and 19 extend at various angles so that the open ends of the pockets will be well distributed about the periphery of the wheel. For instance, as shown in Fig. 1 the double thickness parts 18 and 19 in the first or upper layer of the wheel extend transversely while in the next layer therebelow these parts extend at right angles or vertically while in the third layer the double thickness strips are diagonally arranged and in the fourth layer the double thickness strips are arranged diagonally but at about right angles to the strips of the preceding layer. In the fifth layer down the double thickness portions again extend transversely. Assuming that cloth such as shown in Fig. 2 is used it will be seen that this arrangement produces pockets in the right hand and left hand side of the first layer wherein the pockets have approximately the same extent and are spaced apart about the same extent as in a sectional view across said double thicknesses, but that the pockets and the spaces therebetween both gradually become longer as the upper and lower quarter of this layer is approached. This results of course from the parallel arrangement of the double thicknesses in the cloth and from the circular form of the periphery of the wheel. In the second layer as shown in Fig.

1 the pockets will be shorter and closer together in the upper and lower quarters of the layer and will be spaced farther apart and have greater length in the right and left hand quarters. By arranging the successive layers of the fabric at different angles more or less as suggested in Fig. 1 it will be seen that the open ends of the pockets 17 will on the average be well distributed throughout the entire periphery of the wheel.

The open ends of the pockets 17 presented to the periphery of the wheel will be especially well adapted to receive a large measure of the buffing composition and to have such buffing composition pushed for an appreciable distance back through the tube-like pockets 17. It will be understood of course that when cloth of this character is assembled into a buffing wheel the pockets will not be extended as shown in Fig. 2, but that the two separate thicknesses 18 and 19 will lie relatively close together as shown in Fig. 4. The pocket between the two layers however is present and will be opened enough to receive the buffing composition when the mass of composition is pressed against the periphery of the rotated wheel. It will be seen furthermore that these pockets are particularly well adapted to retain the buffing composition therein because the pockets have been filled for a considerable distance back into the pockets so that a reserve supply of the composition is imbedded in the body of the wheel and will gradually come to the periphery as the wheel is used and particularly will be present in the region immediately back of the periphery as the periphery gradually becomes worn down.

It will be seen that these pockets, being integrally formed in the weaving of the cloth will be permanent, that is will last substantially as long as the cloth and that the pocket will not become worn out or cut out at its working side, that is the rearward side after a little use or before the cloth wears down as is the case with pockets made from folding the cloth or sewing the layers of cloth together.

As will appear particularly from an inspection of Fig. 4, it is obvious that a layer of cloth formed in places with two separate thicknesses as for example the strips 18 and 19, will have a total thickness greater than that of the corresponding single thickness piece of cloth or single thickness portion as 21 of this special cloth. It follows that by using this cloth having integrally formed pockets fewer layers of cloth need be used in forming a buffing wheel of a total desired thickness. This results in a great economy in saving a large percentage of the yardage of cloth heretofore necessary for a buffing wheel. The comparative openness of a buffing wheel made embodying my invention also affords better ventilation for the buffing wheel and a greater contained cubical space open to receive the buffing composition.

It is to be noted also that aside from the integrally formed pockets 17 within each piece of cloth 20 to receive the buffing composition the irregular surface of these pieces of cloth caused by the slight shoulder as 22 at both faces of a layer of cloth and at both sides of the double thickness 18 and 19 afford spaces or ridges which will receive and retain the buffing composition to some extent. This unevenness in the exterior surface of the layer of cloth so as to afford spaces to receive and hold buffing composition is especially noticeable when the successive layers of cloth are arranged with the double thickness strips or parts at various angles crossing each other and especially when a buffing wheel is made up of layers sewed together.

In the modification shown in Fig. 7 a buffing wheel is formed out of whole disk pieces of fabric formed wholly or partly of fabric having integral pockets as shown in Fig. 2 and preferably with the layers arranged so as to bring the double thickness strips at various angles and then the said layers are sewed together as by the stitches 23. In this view portions of several of the nearer layers are removed in order to illustrate the construction.

Figs. 8 and 9 illustrate another embodiment of my invention in that the successive layers of fabric used to build up a buffing wheel are formed of strips as 14 of pieces of the desired cloth instead of whole disk-shaped pieces. In Fig. 8 parts of several of the nearer layers have been removed to show a suggested arrangement of the pieces so as to distribute the open ends of integrally-formed pockets well about the periphery of the wheel. The different layers and the different pieces of the different layers are thoroughly bound together by closely spaced series of stitches such as 25. A pieced, sewed buffing wheel so made is then trimmed to the circular form and when completed appears as shown in Fig. 9.

Fig. 10 illustrates another modification of this invention in that instead of having every layer of the buffing wheel of special cloth having integral pockets a part only of the layers of the wheel will be formed of the integral pocket cloth and a part will be formed from plain fabric, that is fabric having one thickness throughout its area such as the layers 24. Preferably these layers will be scattered through the buffing wheel at more or less regular intervals and offer an opportunity of providing a buffing wheel that will not carry such a heavy layer or measure of the buffing composition as will be done where every layer of the puffing wheel has the integral pockets.

It will be seen that when a buffing wheel formed of the special fabric having parts of

double separate thicknesses is used and sewed together the external irregularity in the surfaces of the said special cloth will result in specially large and effective pockets between the layers in addition to the pockets formed within the layers by the weaving of the pockets.

Fig. 11 is a view of a piece of cloth wherein the separate thicknesses 18 and 19 instead of extending across the width of the cloth as shown in Figs. 1 and 2 extend as short separated sections 26 crosswise of the cloth. The next series of double thicknesses are also short sections shown as placed opposite the single layer parts between the first set of short sections so as to give the cloth the appearance more or less of a checkerboard pattern. In the cloth illustrated in Fig. 12 somewhat longer sections 27 of the double layer parts are used and these sections 27 overlap to some extent in successive rows. In the construction suggested in Fig. 13 the double layered portions 28 are shown as short sections of two different lengths extending longitudinally of the cloth and with the longer and shorter sections 28 alternately and oppositely arranged in successive rows. In the cloth diagrammatically shown in Fig. 14 a row of short double thickness portions 29 extends across the fabric but with the sections indicating pockets formed lengthwise of the fabric. Next to the row of sections 29 is a cross row of short sections 30 of double thicknesses with these sections in staggered or checkerboard relation relative to the sections of the first row, but these sections are indicated as being formed of pockets extending transversely of the cloth.

It will be understood that the illustration of various arrangements of the double thickness portion in the fabric is simply suggestive and not intended as limitations as to the form of cloth that may be used in buffing wheels embodying my invention.

A further advantage of buffing wheel formed pursuant to this invention is that on account of the pockets being integral with each layer of cloth instead of being formed by sewing two or more layers of cloth together, a buffing wheel of the type illustrated in this application will be much more flexible. When several layers of cloth are sewed together the sewing necessarily stiffens the buffing wheel or section of buffing wheel so sewed and prevents the different individual layers of cloth from readily bending to adapt themselves to the shape of the article being buffed. A buffing wheel of my form will have effective pockets and yet may be made extremely flexible by forming a wheel as shown in Fig. 1 without sewing the different layers of fabric together except near the center of the wheel.

Figs. 15 and 16 illustrate another embodiment of my invention, this time applied to the form of buffing wheel where the layers of fabric are composed of angular shaped pieces rather than regular strips of fabric. These angular shaped pieces are formed from the cloth that is left when large disks are cut out of lengths of cloth. These angular or wedge-shaped pieces 31 are matched together to form substantially complete disk-shaped layers with the pieces 31 in the different layers arranged so as to have the joints between the adjacent pieces in the same layer be spaced away from the similar joints of adjacent layers. In Fig. 15 a part of the top layer is broken away to show the construction. It will be understood of course that all or a desired proportion of the pieces 31 will be formed of fabric having the integrally-formed pockets above described. The pieces will be shaped as far as practicable with the open ends of the pockets directed to the periphery of the buffing wheel but this arrangement is not necessary in every piece or in every layer any more than in other forms of my invention already described.

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

1. A buffing wheel composed of a plurality of disk-shaped layers of fabric certain layers of which have portions composed of a plurality of integrally-formed, separate thicknesses forming pockets in such layers, the sides of which are positively connected by seamless joints.

2. A buffing wheel composed of a plurality of layers of disk-shaped layers of fabric, certain layers of which are woven in places with two separate thicknesses with said two thicknesses integrally formed with and positively connected by the intervening single-thickness portions of said layers, whereby positively formed pockets with seamless joints are provided between each pair of such double thicknesses of a fabric layer.

3. A buffing wheel composed of a plurality of disk-shaped layers of fabric, certain of said layers being fabric formed in places with two separate thicknesses which are integrally connected by seamless joints with other parts of the fabric having only one thickness, the spaces between such double thicknesses at the periphery forming open pockets to receive and retain buffing composition.

4. A buffing wheel composed of a plurality of layers of fabric, certain of which layers are fabric having integrally formed pockets therein composed of separate thicknesses of fabric integrally connected to intervening single thickness parts of the layer of fabric.

5. A buffing wheel composed of a plurality of disk-shaped layers of fabric, certain of which layers are fabric having integrally formed substantially parallel tubes therein formed by parts of the layer of fabric having a plurality of thicknesses integrally joined at their edges to single thickness parts of the

layer of fabric adapted to receive and retain the buffing composition.

6. A buffing wheel composed of a plurality of disk-shaped layers of fabric, certain of said layers being fabric woven in places with a plurality of separate thicknesses which are integrally connected by seamless joints with other parts of the fabric having a lesser number of thicknesses, the spaces between such multiple thicknesses of a layer of fabric forming at the periphery open pockets in such layer to receive and retain buffing composition.

In witness whereof I have affixed my signature, this 28th day of September 1929.

BRADFORD H. DIVINE.