

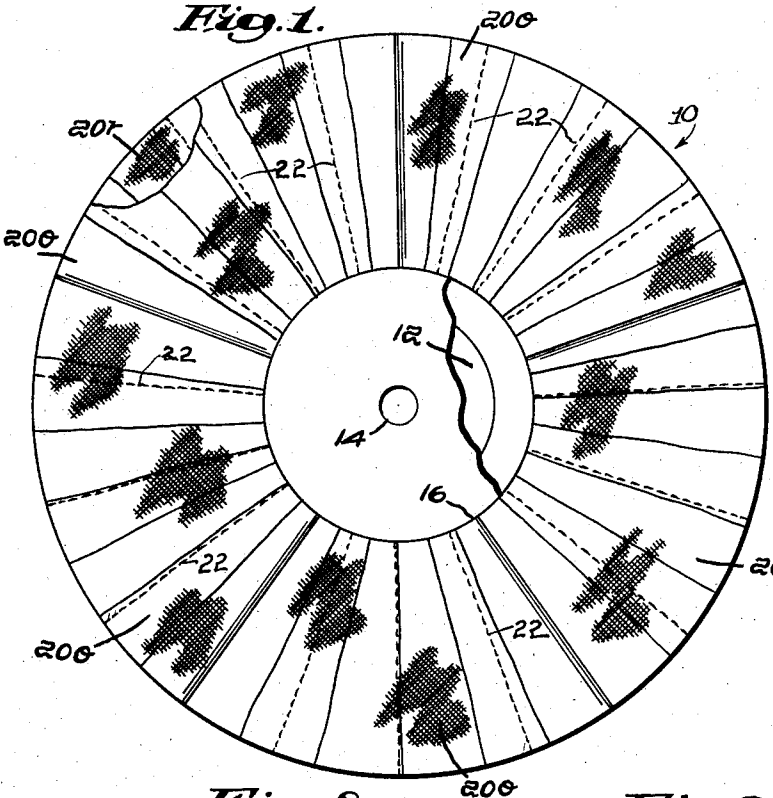
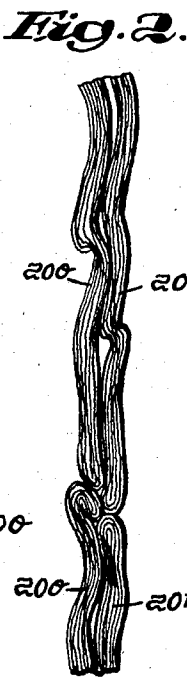
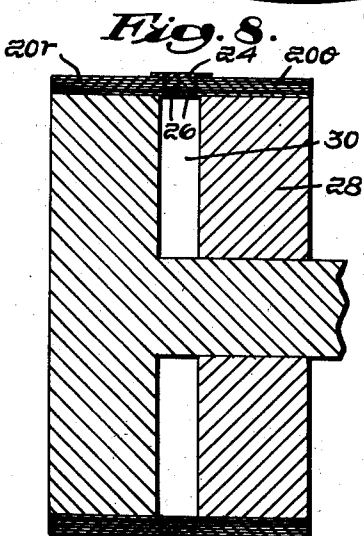
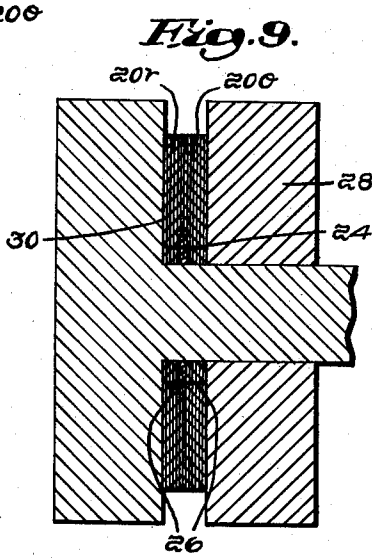
May 12, 1959

A. S. ROCK
BUFFING WHEEL

2,885,834

Filed June 27, 1957

2 Sheets-Sheet 1



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Fig. 3.

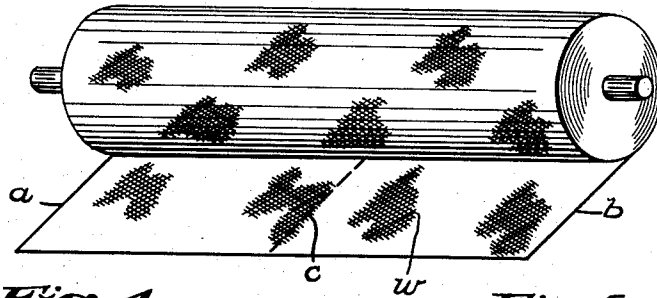


Fig. 4.



Fig. 5.

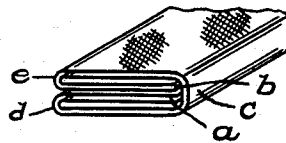


Fig. 6.

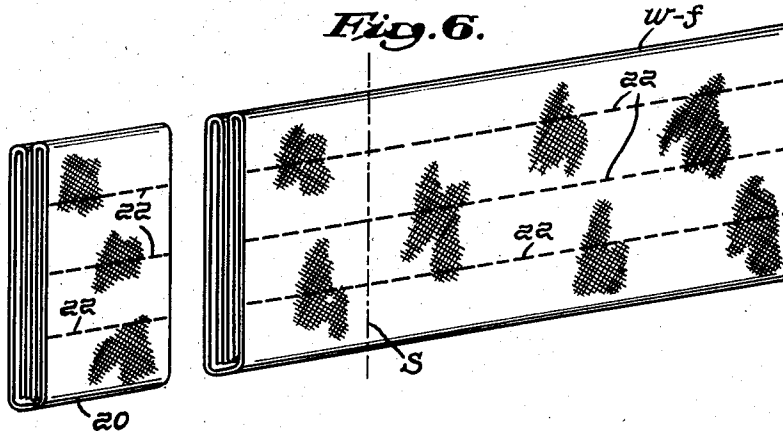
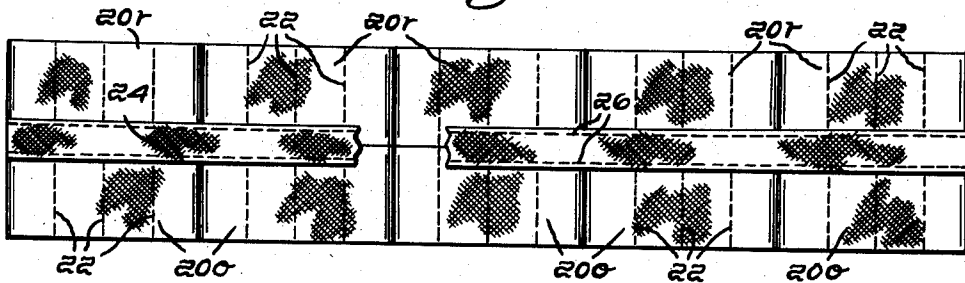


Fig. 7.



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2,885,834

BUFFING WHEEL

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Application June 27, 1957, Serial No. 668,441

5 Claims. (Cl. 51—193)

This invention relates to buffing wheels of the kind utilizing a mass of fibrous buffing material organized as an annulus supported by a center which is in turn mounted on a revolving shaft. I here illustrate and describe a wheel of restricted axial width which could be used alone as such, but which usually would be termed a "section," being assembled with others to provide a wheel with a relatively wide face.

One well known type of buffing element, the so-called "ruffled buff" is made from an effectively continuous ring comprising a strip of bias fabric wound on itself in the form of a cylinder and comprising a multiplicity of plies. Such a ring is folded on itself outwardly about its center line with concomitant compaction of the material adjacent that line, and usually, although in lesser degree, throughout the width of the ring to provide two flat annuli side by side having pleatings or rufflings produced incidentally to its transformation in form. This duplex annulus is mounted on a supporting center of one kind or another.

Another type of buff is the so-called "finger buff" in which the annulus is formed of a great number of radially disposed "fingers" which, as the name implies, are of relatively great length compared with their axial thickness and circumferential width. Such fingers may be formed from plied bias fabric. It may be conjectured that this type of wheel was inspired by a brush having tufts of bristles corresponding to the fingers. Various expedients have been resorted to for anchoring the inner ends of the fingers in a compact grouping but because of their relatively flaring disposition the outer ends were spaced and the working face of the wheel rather open.

In accordance with my invention I provide a novel form of buff, simply and inexpensively produced, which in many of its aspects is the equivalent of a ruffled buff, but also having certain advantageous features of the finger type of buff.

My invention will be well understood by reference to the following description of an illustrative embodiment thereof, shown by way of example in the accompanying drawings wherein:

Fig. 1 is a side elevation of a buffing wheel unit or section;

Fig. 2 is a partial edge view of the same on a larger scale;

Figs. 3, 4 and 5 are diagrammatic perspective views illustrating successive steps in preparing by one suitable method a plied strip from which strip the "slabs" which are used in forming the buff are produced;

Fig. 6 is a view in perspective on a larger scale illustrating the formation of individual slabs from a plied strip made as disclosed in Figs. 4 and 5;

Fig. 7 is a plan view with parts broken away, showing the assembly of a number of slabs; and

Figs. 8 and 9 illustrate steps in the treatment of the assembly shown in Fig. 7 to form a duplex annulus of buffing material as shown in Fig. 1.

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Referring now more particularly to Fig. 1, the finished buff as there shown comprises an annular mass 10 of buffing material such as bias fabric, rigidly supported by a center 12, which may be made of chipboard or other light and cheap material and which is pierced with an opening 14 to receive a mounting shaft. Sideplates 16 of fiberboard or the like overlap the inner circumference of the annulus. This arrangement of center and sideplates is conventional and any means customary in the art may be used for uniting the elements so far referred to.

The annular mass of buffing material herein consists of a pair of annuli which, merely for convenience, may be referred to as an obverse annulus and a reverse annulus and I have appended to the reference numeral the letters *o* and *r* where a distinction seems useful, but also use the reference numeral alone when the reference is generic. The words are not otherwise significant. In viewing the wheel from the side as in Fig. 1 the nearer annulus would be the obverse annulus and the farther annulus in axial alignment therewith, and shown in Fig. 1 at the broken away portion, would be the reverse annulus.

These annuli are each formed of a small number of "slabs" 20—*o* and 20—*r* respectively, made of bias fabric and set edge to edge and in the finished wheel corresponding to circular ring sectors which form an entire, although divided, circular ring or annulus. In the example shown in Fig. 1 (and Fig. 6) five slabs 20 form the circuit. The slabs are formed from suitable woven fabric and the edges thereof exposed at the circumference of the wheel are biased to the weave of the fabric. One suitable way of forming them is illustrated in Figs. 3 through 7.

In Fig. 3 I have illustrated a web of bias strip *w* of indefinitely great length as is suggested in the drawing by its being shown as if being dispensed from a roll. Such strips are prepared from woven fabric by means known in the art. A length of the strip *w* is drawn forward and the two side edges *a* and *b* are folded over to the center line *c* in the manner shown in Fig. 4, providing a strip half as wide as before with double edges *d* and *e*. Such a strip may be folded again along the line *c* to bring doubled edges *e* and *d* together as shown in Figs. 5 and 6, providing a double or folded edge along the line *c* and enclosing the original raw edges *a* and *b* in the interior within the fold.

The resulting structure as illustrated is four-ply. Generally a greater number of plies will be desired. If the original strip *w* were wide enough the strip of Fig. 5 could be doubled again along a longitudinal line to form eight plies or, as I recommend, two superposed webs *w* could be treated as one in performing the steps illustrated in Figs. 4 and 5. On account of the difficulty in illustration, I am referring to this verbally only as the representation in a patent drawing of grouped plies of very thin material is not practical. Representations of a buff will be at a reduced scale and even the full thickness of a sheet of fabric could not conveniently be illustrated by a double line and the use of a single line would imply a spacing which would not exist in practice. Whatever method of folding the plied material may be utilized, it is desirable that a multiplicity of exposed double (folded) edges be at the sides of the strip and the raw edges inside.

The folded strip *w*—*f* illustrated in Fig. 5 may be made of indefinite length and may be sewn through lengthwise by a number of seams 22, Fig. 6. From one end of the strip a "slab" 20 is severed as seen at the left of Fig. 6. The line *s* is the line of severance which would form another slab from the strip *w*—*f*. The slab 20 as will appear has two opposite edges (the circumferential edges of the ultimate circular ring sector) which have raw edges exposing the threads on the bias and corre-

sponding to the lines of severance, while the other two sides (the ultimate radial edges) are folded or double.

The word "slab" has herein been chosen to convey the idea that the severed segments are inherently flat, not very thick yet substantially so, not being a mere thin sheet, and are of extended area. They resemble in a way a tile or a block of memorandum paper. They are distinguished from a "finger" which is several times as long as it is wide, and where the impression is primarily one of extension in length. We are concerned here with a shingle and not with a lath. The slabs might be said to be "squarish," although they are not necessarily, or indeed usually, equilateral parallelograms. The width between the folded edges is at least a major fraction of the depth between the cut or raw edges and indeed desirably greater, although not several times greater. The width between the folded edges is such that a small number will provide the circuit of the wheel. I recommend at least five, as shown, and not more than ten. Smaller or greater numbers would constitute an unduly inefficient application of the principles of the invention. In numbers which we would count by tens rather than by units, we would have "fingers" rather than "slabs" which would not lend themselves to the manufacture of the wheel in the manner hereinafter described and which would lead to entirely different results.

The developed width of the slabs, that is the width between the folded edges in the flat form shown at the left of Fig. 6, is such that the sum is greater at least than the inner circumference which they will occupy in the wheel, and preferably also than the outer circumference. This provides for upsetting or crumpling of the slabs in the circumferential direction in a manner analogous to the upsetting of the annuli in the usual ruffled buff as will appear.

An actual wheel from which Figs. 1 and 2 were drawn, was 11 inches in over-all diameter with a three-inch center, and each annulus was made with five slabs which were about eight inches wide (circumferential width) and about four inches deep (radial width). It will be understood that these figures are merely illustrative and provide one specific example of the construction effected by the use of "slabs" as above described.

In the form of the invention illustrated a suitable number of slabs 20, each of a length corresponding substantially to the radial depth of the fabric portion of the wheel, are arranged in two rows as shown in Fig. 7, where they have been marked 20—o and 20—r, because they will form parts of the obverse and reverse annuli respectively. In the example shown the folded edges of adjacent slabs in each row adjoin each other along the vertical lines viewing the figure, and one of the raw edges is exposed at a side of the assembly. In the example shown the slabs are not staggered in the two rows. The adjacent longitudinal edges of the two series of slabs are then loosely articulated to secure them together while permitting folding them face to face with the outer edges together. While a slab of double length might be folded across its median to provide integrally connected portions in each of the annuli it is generally desirable, in wheels wherein the fabric portion is of small inner circumference to avoid this, and where there is no folding of the material of the slabs themselves, that very little bulk be added along the line where they are joined. A single ply 24 of suitable strong fabric, which may be narrower than the double depth of the slabs, in other words a tape, may be extended longitudinally along the line of junction between the two rows and secured to their edges by the lines of stitching 26. Even with folded slabs such a tape or two tapes at either side of the fold would desirably be used to hold the slabs together for the following steps in manufacture next to be described. The zone of application of such a tape is not wide and the successive circumferentially placed slabs are joined only in a zone of restricted radial extent adjacent the

inner circumference and outwardly thereof are free of each other, or, to put it another way, have open joints substantially throughout their depth.

The assembly of Fig. 7, embodying a sufficient number of slabs to form a circuit of the complete wheel, may then be placed as seen in Fig. 8 on a suitable drum 28, having a central groove 30 therein, the bottom of the groove being substantially of the diameter of the internal circumference desired in the completed annulus of buffing material (diameter of center 12) and the external diameter of the drum being preferably substantially greater than the outer diameter of the completed wheel. The edges of the slabs where joined by the tape 24 are over the groove 30. The central portion of the assembly is then pressed down into the groove upsetting the two sets of slabs 20—o and 20—r into radial planes as they are drawn down into, and closely confined by the sides of, the groove 26. They are thus upset and crumpled circumferentially because their developed length is much greater than the length of the circumferences to which the various parts are brought. The lines of sewing 22 are sufficiently far apart to permit differential movement of the plies between them and effective crumpling. The annuli will be tightly compacted at the inner periphery and less so as the outer circumference is approached where undulations or ruffings are formed which open up somewhat when the annuli are freed from lateral restraint.

Fig. 9 shows the process completed. The annular mass of buffing material thus formed with its convolutions or compressions may then be removed from the drum and assembled in desired manner with a supporting core or center. In Fig. 1 the ruffling in the outwardly extending portion of the buff is shown rather diagrammatically by wavy lines. Fig. 2 is somewhat more realistic and shows a characteristic crumpling, such as may appear at the periphery of the buff. It is however only exemplary of the general appearance and the disposition of the undulations or crumplings will vary around the circumference and may not be duplicated in any other buff, as they occur more or less at haphazard as the result of the operations illustrated by Figs. 8 and 9.

The edges of the slabs which abut in Fig. 7 are pressed toward one another and may move over one another slightly or, as illustrated in Fig. 2 an edge may turn back on itself, forming a short fold and exposing the edge of an adjacent slab of the other annulus as indicated. There is no regularity about this. Subject to such minor irregularities the slabs of the annulus are aligned one behind the other substantially in edge to edge contiguity but with open joints between them. Surplus length along any circumferential line is absorbed by the ruffings of the slab itself rather than by extension of the body of the slab into an adjacent sector.

In the use of the wheel the several slabs have a certain freedom of movement as the edge of the wheel moves over the work, and their relative positions may change somewhat in the course of the work, which is a desirable feature. In use the leading edge of a slab may be deflected back and its leading edge function as such, being supported by the considerable circumferential length of fabric succeeding it. Seams 22 contribute to such support, but do not bind the plies rigidly together throughout the slab thickness. The slab does not fold over as a narrow finger might, losing its bias presentation to the work and exposing the woven edge to the work with resultant rapid dilapidation. The slab remains self-sustaining and independent of the slabs at either side of it (except where mounted at its inner circumference). It is not tied in or joined by extraneous elements, such as fabric sheets bridging the open radial joints between slabs. Although the plies of the annulus are not continuous throughout the circumference, the arrangement of the parts with folds at the radial edges of the slabs is such that fraying is minimized. The pockets formed by the seams 22 and the

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doubled edges (radial edges) of the slabs provide radial pockets retaining the buffing compound.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, as is in fact clear in several matters from the description itself. Reference is to be had to the appended claims to indicate those principles of the invention exemplified by the particular embodiment described and which I desire to secure by Letters Patent.

I claim:

1. A buffing wheel comprising a center and an annular mass of buffing material firmly secured thereto and comprising a pair of annuli set side by side and anchored to the center in such side by side position at their inner peripheries, each annulus consisting of a series of generally quadrilateral slabs each of which is of bias fabric strip folded up to provide multiple plies with bias presentation of the threads at the outer periphery and doubled edges adjacent the radial boundaries of the slab, the slabs being disjoined except in a zone of restricted radial extent along the inner circumference where they are anchored to the center, the annuli and the slabs therein being free of one another outwardly of such zone, the slabs having a circumferential dimension which is at least a major fraction of their radial dimension, the sum of their developed circumferential dimensions being substantially longer than their dimension in the wheel at least along the inner circumference, the slabs being circumferentially upset and crumpled to accommodate the excess, and in each annulus being disposed in substantial edge to edge contiguity with open joints between them.

2. A buffing wheel as set forth in claim 1 wherein the individual slabs have their plies joined by several spaced radial seams.

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3. A buffing wheel as set forth in claim 1 wherein the slabs of the respective annuli are separate elements and loosely articulated along the inner circumference without substantial increase in bulk at the joining.

4. A buffing wheel comprising a center and an annular mass of buffing material firmly secured thereto and comprising a pair of annuli set side by side and anchored to the center in such side by side position at their inner peripheries, each annulus consisting of a series of generally quadrilateral slabs each of which is of bias fabric strip folded up to provide multiple plies with bias presentation of the threads at the outer periphery and doubled edges adjacent the radial boundaries of the slab, the slabs being disjoined except in a zone of restricted radial extent along the inner circumference where they are anchored to the center, the annuli and the slabs therein being free of one another outwardly of such zone, the slabs having a circumferential dimension which is at least a major fraction of their radial dimension, the sum of their developed circumferential dimensions being substantially longer than their dimension in the wheel along both the inner and outer circumferences, the slabs being circumferentially upset and crumpled to accommodate the excess, and in each annulus being disposed in substantial edge to edge contiguity with open joints between them.

5. A buffing wheel as set forth in claim 4 wherein the individual slabs have their plies joined by several spaced radial seams.

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