Aug. 6, 1935. H. F. L. PFOHL 2,010,106

BUFFING AND POLISHING WHEEL

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FIG. 1.

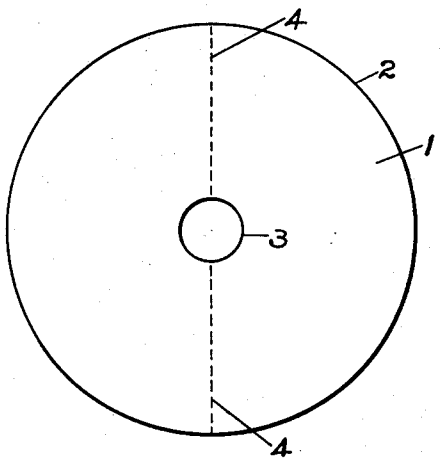


FIG. 2.

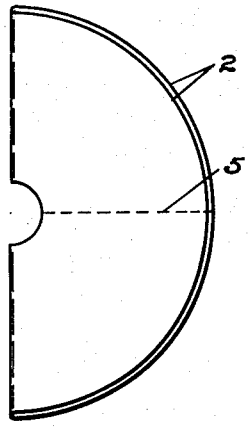
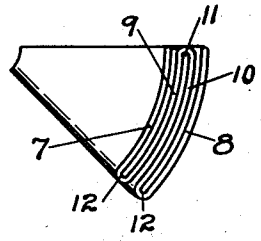


FIG. 4.



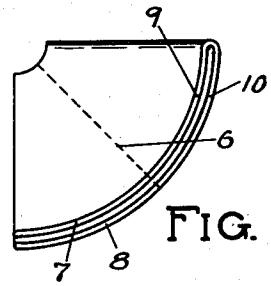


FIG. 3.

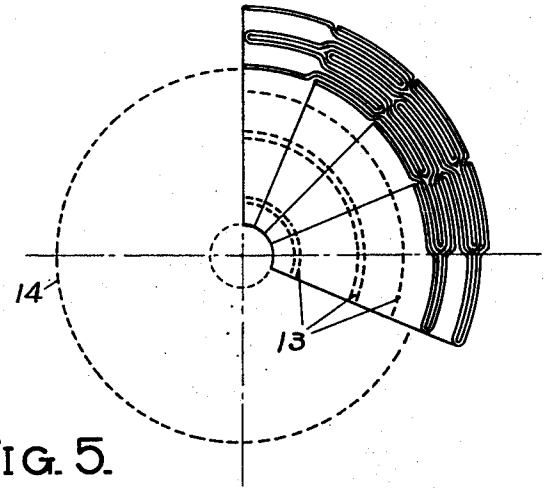


FIG. 5.

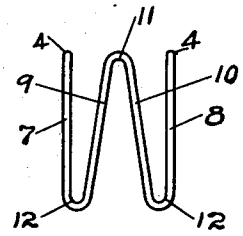


FIG. 6.

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FIG. 7.

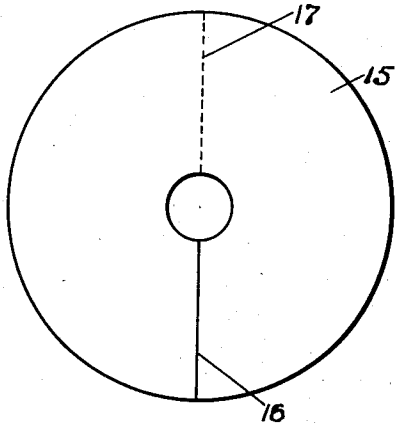


FIG. 8.

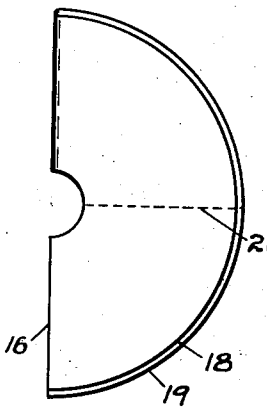
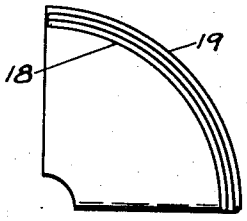


FIG. 9.



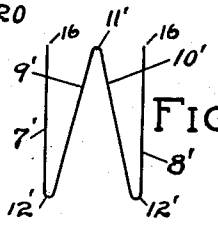


FIG. 16.

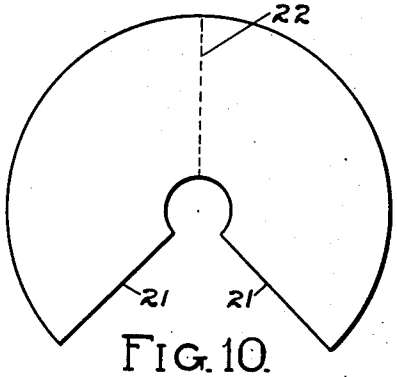


FIG. 10.

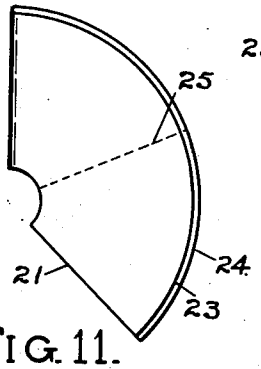


FIG. 11.

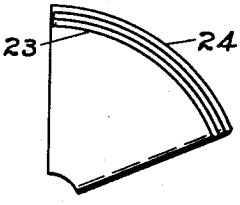


FIG. 12.

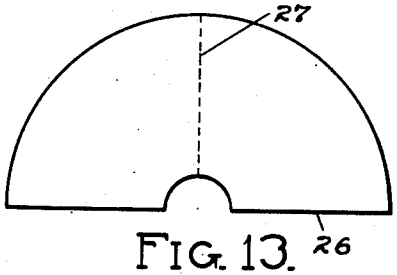


FIG. 13.

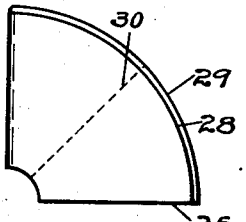


FIG. 14.

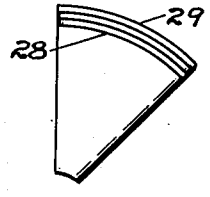


FIG. 15.

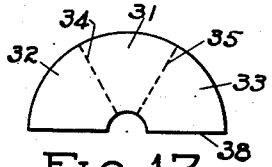


FIG. 17.

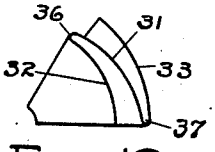


FIG. 18.

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UNITED STATES PATENT OFFICE

2,010,106

BUFFING AND POLISHING WHEEL

Harold F. L. Pfohl, Buffalo, N. Y.

Application February 9, 1934, Serial No. 710,485

9 Claims. (Cl. 51—193)

This invention relates to wheels for buffing and polishing which are made up of layers of fabric, cloth or similar material sewed together and formed into a wheel for mounting on an arbor. The arbor and buffing wheel are then rotated and various bodies or metals held against the periphery of said wheel for "cutting down" the rough surface by buffing and then obtaining a polished surface.

To obtain the desired cutting and the high luster on the finished piece by the buffing wheel, various buffing compositions are used on said wheel for removing scratches and other imperfections from the surface. The buffing is usually a two wheel operation: the first wheel cutting down to produce a smooth surface and the second wheel to color for a final finish. The buffing composition, usually of a moulded form, is the medium for doing most of the work and being made of combinations of abrasives and greases of different melting points is taken up by the buffing fabric when held against the rotating wheel to produce the necessary heat.

A usual form of buffing wheel has been made of separate full disks of fabric or cloth piled one upon the other to the desired thickness and sewed in a circular fashion by concentric or spiral rows of sewing. With this form of wheel the peripheral edge of each separate disk acts somewhat like a circular saw to cut minute grooves in the work when held in one position against the wheel. This form of buffing wheel has also been sewed in straight lines across the wheel to form sewed pockets to help retain the buffing composition and to break up the sawing effect of the disks.

Other methods of building up buffing wheels are by using various shaped pieces of fabric and sewing them together and also combining several thin wheels to make the ordinary size for thickness.

I have discovered that the ideal way of using fabric for buffing purposes is to sweep the edge of said fabric flatwise against the work and at right angles to the present edgewise method which has a tendency to form grooves.

One object of the present invention is to provide buffing wheels in which the periphery or buffing edge does not follow completely around the wheel to form a continuous cutting edge but is made up of sections, each of which starts from one side of the wheel and forms a continuous edge completely across the wheel to the other side.

Another object is to provide an improved buffing wheel with pockets to help retain the buffing compound.

Another object is to provide an improved buffing wheel which can be rotated in one direction for cutting or smoothing and in the opposite direction for coloring and finishing.

Another object is to provide an improved construction which is economical in manufacture and with a greater operating efficiency.

With these objects in view, the invention consists in certain features of novelty in the construction, combination and arrangement of parts by which the said objects and certain other objects which will hereinafter appear are attained the invention being more particularly pointed out in the claims.

In the drawings accompanying and forming a part of this specification,

Figure 1 is a plan view of a single and complete disk of fabric or other suitable material from which my preferred improved buffing and polishing wheel can be built up and showing the central hole for an arbor and a dotted line on which it is folded as a first operation toward building up said wheel.

Fig. 2 is a perspective view of a doubled half disk made by folding the disk on the dotted line of Fig. 1.

Fig. 3 is a perspective view of a quarter disk of quadruple thickness made by folding the half disk on the dotted line of Fig. 2.

Fig. 4 is a perspective view of a one-eighth disk of octuple thickness made by folding back the doubled edges on the dotted line of Fig. 3 and in opposite directions so the peripheral edge view shows a W or corrugated shape.

Fig. 5 is a perspective view of four of the one-eighth disks of Fig. 4 telescoped together to form one quarter of a completed built up buffing wheel according to my invention.

Fig. 6 shows the W or corrugated form of the peripheral edge view of the one-eighth disk of Fig. 4 and to indicate that in the built up wheel of Fig. 5 each one-eighth disk extends from one side of the buffing wheel to the opposite side of said wheel to make a continuous and unbroken wiping surface.

Figs. 7 to 16 are views of disks or portions of disks for making modifications of buffing wheels according to my invention:

Fig. 7 being a plan view of a complete disk cut on one radius.

Fig. 8 is a perspective view of a doubled half disk made by folding the disk on the cut radius and dotted line of Fig. 7.

Fig. 9 is a perspective view of a quarter disk of quadruple thickness made by folding back the cut edges on the dotted line of Fig. 8 and in opposite directions so the peripheral edge view shows a W or corrugated shape.

Fig. 10 is a plan view of a three quarter disk.

Fig. 11 is a perspective view of a doubled three-quarter disk made by folding the disk on the dotted line of Fig. 10.

Fig. 12 is a perspective view of a three-sixteenths disk of quadruple thickness made by folding back the cut edges on the dotted line of Fig. 11 and in opposite directions so the peripheral edge view shows a W or corrugated shape.

Fig. 13 is a plan view of a one-half disk.

Fig. 14 is a perspective view of a doubled one-half disk made by folding the disk on the dotted line of Fig. 13.

Fig. 15 is a perspective view of a one-eighth disk of quadruple thickness made by folding back the cut edges on the dotted line of Fig. 14 and in opposite directions so the peripheral edge view shows a W or corrugated shape.

Fig. 16 shows the W or corrugated shape of the peripheral edge view of the disks of Figs. 9, 12 and 15.

Figs. 17 and 18 are views of another modification in which, Fig. 17 is a plan view of a half disk and Fig. 18 a perspective view, more or less diagrammatic, of a one-half disk folded on the two dotted radial lines of Fig. 17.

With reference more in detail to the figures of the drawings it will be seen that this invention relates to buffing wheels preferably made up of sections folded from whole disks and arranged to interlock or telescope and be sewed together as in Fig. 5. In Fig. 1, 1 is the disk having a periphery 2 and a central hole 3. 4 is the dotted line on the diameter of disk 1 on which it is folded to make the half disk of double thickness in Fig. 2. 5 is the radial dotted line on which the half disk of Fig. 2 is folded to make the quarter disk of fourfold thickness of Fig. 3. 6 is the radial dotted line in Fig. 3 equally dividing the quarter disk and on which the portions 7 and 8 are turned back in opposite directions on portions 9 and 10 to make the one-eighth disk of eight fold thickness in Fig. 4. The peripheral edge then of the folded disk in Fig. 4 is shown in Fig. 6 and somewhat distended to more clearly show its W or corrugated shape and that it forms one pocket 11 in the upper part of the W and two pockets 12, 12 in the opposite direction in the lower part of the W. The fabric being doubled the pockets 11 and 12, 12 are doubled pockets.

To build up a buffing wheel from the one-eighth sections as of Fig. 4, sixteen of them are laid around in the from of a wheel and telescoped or nested one-half of the W or corrugated depth by inserting the pocket portions 12, 12 of one section between the 7—9 and 8—10 portions of another section as shown in Fig. 5. The sections are then sewed together by lines of sewing 13 (Fig. 5) to form a wheel having 16 thicknesses of material and the circular peripheral continuity of each thickness is broken up by the different folds so that in each section it completely crosses the wheel from one side to the other.

The thickness of the wheel can be regulated by the number of disks folded together, and in actual practice it is found that a satisfactory thickness is attained by placing two disks together as of Fig. 1. Simply laying together two disks or fastening as desired, they are folded as in Figs. 2, 3 and 4 and then built up into a wheel as in Fig. 5, making a wheel of thirty two thicknesses of material. Cover plates of single whole fabric disks are laid on each side of the built up wheel of Fig. 5 and sewed into it to help tie the sections together and as indicated on one side by the dotted circle 14, but as these covers may or may not reach the edge of the circumference of the wheel they are not otherwise shown.

The modification in Figs. 7, 8 and 9 shows a whole disk 15 having a radial cut 16 and a dotted radius 17 on which said disk 15 is folded to form the doubled half disk in Fig. 8. The lower quarter portions 18 and 19 having cut radial edges 16 of Fig. 8 are now folded back in opposite directions on the dotted line 20 to form the quarter disk of fourfold thickness of Fig. 9 and having a peripheral edge with a W or corrugated shape illustrated by the elevation of a W in Fig. 16. Or folding disk 15 first to bring line 17 on to line 16 and second folding on line 17 to make 18 and 19 outside layers as in Fig. 9.

The modification in Figs. 10, 11 and 12 shows a disk cut on radial lines 21 and leaving out a one-quarter sector of the said disk. It is then folded on dotted line 22 of Fig. 10 to form the doubled three-eighths disk of Fig. 11. The lower portions 23 and 24 with the cut radial edges 21 of Fig. 11 are now folded back in opposite directions on the dotted line 25 to form the three-sixteenths disk of fourfold thickness of Fig. 12 and having a peripheral edge with a W shape illustrated by the elevation of a W in Fig. 16.

The modification in Figs. 13, 14 and 15 shows a half disk cut from a whole disk on the diameter 26 and folded on the dotted line 27 of Fig. 13 to form the doubled quarter disk of Fig. 14. The lower portions 28 and 29 with the cut edges 26 of Fig. 14 are now folded back in opposite directions on the dotted line 30 to form the one-eighth disk of fourfold thickness of Fig. 15 and having a peripheral edge with a W shape illustrated by the elevation of a W in Fig. 16.

In Fig. 16 the W shape of the perpiheral edge of the folded fabric corresponds to the W shape of Fig. 6 and the different portions are of single thickness and designated at 7', 8', 9', 10', 11', and 12'.

The modification shown in Figs. 17 and 18 is made from a half disk cut from a whole disk on diameter 33 and folded in a manner to provide an N or corrugated shape with two pockets pointing in opposite directions. 34 and 35 are dotted lines on the plan of the half disk of Fig. 17 dividing it into three equal parts or sectors 31, 32 and 33. The sectors 32 and 33 are folded on opposite sides of sector 31 and on the dotted lines 34 and 35 to form the threefold section of Fig. 18, said section having an N or corrugated shape formed from the peripheral edge of sectors 31, 32 and 33 and having oppositely disposed V shaped pockets 36 and 37.

The half disk of Figs. 17 and 18 can be made from a whole disk and folded on the line 33. In this case the peripheral edge with the N shape as formed by 31, 32 and 33 will show doubled the same as the peripheral edge of the W shape in Fig. 6.

It will be understood that where the folded sections are made from a whole disk as from Fig. 1, there will be no cut radial edge but only a folded radial edge as 4 of Fig. 6. Where sections are made from a disk having a radial cut as in Fig. 7 or a portion cut out as in Fig. 10,

etc. there will be a raw or cut radial edge as 16 in Fig. 16.

In building a buffing wheel according to my invention to be made up of sections formed from whole disks and folded as in my preferred construction and as shown in Figs. 1 to 6, it will be noted that it requires four operations as in Figs. 2, 3 and 4 to fold a disk to make a section having a periphery with the W shape of Fig. 6 and that each leg of the W is of double thickness.

In building a buffing wheel according to my invention to be made up of sections formed from disks which are cut on a radius or having portions cut out as in the modifications shown in Figs. 7 to 16, it will be noted that it requires three operations as in Figs. 8–9, 11–12 and 14–15 to fold a disk or portion of a disk to make a section having a periphery with the W shape of Fig. 16 and that each leg of the W is of single thickness. Or two operations, as by folding line 17 (Fig. 7) on to line 16 and then folding on line 17 to make 18 and 19 outside layers as in Fig. 9.

In building a buffing wheel according to my invention to be made up of sections formed from a half disk as in Figs. 17 and 18 requires but two operations to form the N shape and each leg being of single thickness. If made of a whole disk and first folded to make the half disk each leg would be of double thickness and have no cut radial edge.

To build up a buffing wheel from the sections shown in the modifications, said sections are laid around in the form of a wheel and telescoped to form a complete wheel as described in reference to the sections of Fig. 4 and shown interlocked in Fig. 5, it being understood that sections folded to make one-eighth of a disk and telescoped for one-half the depth require sixteen sections to make a complete wheel, while sections folded to make one-quarter of a disk and telescoped one half the depth require only eight sections to complete a wheel.

Referring to the W shape of the folded disk formed to make a built up wheel with sections, each of which forms a continuous and unbroken peripheral line from one side of said wheel to the other, it will be seen that said W shape forms a central pocket pointing in one direction and two other pockets formed to point in the opposite direction. These pockets which are adapted to receive and retain buffing composition will therefore present more of said composition for the buffing and cutting when the wheel rotates in one direction than in the opposite direction, the latter direction of rotation being more adapted for polishing or finishing.

In a buffing wheel it is important to have the peripheral edge of the wheel flexible enough to conform somewhat to the shape of the article being buffed, but it can be too flexible as in the case of the wheel made entirely of whole flat disks unless sewed nearly to the periphery. In my construction the folding in the manner described with sections extending completely across from side to side allows for flexibility yet each fold supports the adjacent fold across the wheel.

The folding also allows for the spreading of the folds and a good ventilation of the wheel from the air currents caused by the speed of rotation.

Where the wheel is built up with folded whole disks and without any radial cuts of the fabric there is less raveling and so a longer life of the wheel.

The ordinary buffing or polishing wheel is usually constructed of flexible material woven into fabric and die cut into a disk shape but I do not limit myself to any particular material except such as can be folded to provide pockets and sections to extend from one side of a wheel to another. It will be understood that more folds could be formed beyond a simple W shape but it has practical limitations in manufacturing on account of the number of sections, the reduced telescoping area and cost of handling the parts.

The increased pockets and width of wheel desirable is taken care of by the piling up of the number of disks wanted before folding.

Having thus described my invention, I claim:

1. A buffing wheel composed of a plurality of sections, each of said sections composed of a disk folded to form a peripheral edge in the shape of a W, telescoping said sections as W's to form a wheel whereby the periphery of each of said sections extends in an unbroken line from one side of said wheel to the other.

2. A buffing wheel composed of a plurality of sections, each of said sections formed by radially folding disk to form a continuous peripheral edge in the shape of a W and telescoping said sections as W's to form a wheel.

3. A buffing wheel composed of a plurality of sections, each of said sections formed of fabric folded with a peripheral edge in the shape of a W, each of said sections nested as W's with adjacent sections to form a wheel and the peripheral edge of each of said sections extending in an unbroken line from one side of said wheel to the other.

4. A buffing wheel of built-up construction composed of a plurality of sections, each of said sections formed from disks folded to sector shape, each of said sections having a W peripheral edge and uniformly interleaved as a W with a preceding and a following section to form circumferential layers into wheel form, whereby said built-up wheel has a succession of sectors circumferentially aligned, in radially detached but near relation, to form substantially a disk layer for each thickness of material and whereby each section forms an unbroken peripheral line completely across said wheel.

5. A buffing wheel in the form of a flat disk comprising a plurality of disk shaped layers of fabric which form said wheel, each of said disk shaped layers composed of a series of sectors radially disposed in independent but near relation to complete each of said disk shaped layers, a plurality of sections folded to make a W peripheral edge and interleaved as W's with an equal number of overlapping folds of each section to form said disk shaped layers and each of said sections forming a continuous peripheral edge in a W shape from side to side of said wheel.

6. A buffing wheel comprising a number of thicknesses of material arranged in layers in the form of a flat disk, the lateral thickness of said wheel being substantially uniform throughout, each of the several layers forming a substantially complete disk and said disks assembled in parallel relation to each other to form said wheel, said disks composed of a plurality of folded sector shaped sections each having a W peripheral edge and said sections arranged about a common center in W overlapped radial positions, nested as W's with similar overlapping portions of each section forming the several disk shaped layers of the wheel, and each of said sections forming

a continuous corrugated line across the periphery of said wheel.

7. A buffing wheel composed of a plurality of sections, each of said sections formed to sector shape having radial folds and outside layers with cut edges by folding a radially cut disk first in a direction at an angle to said radial cut and second in the direction of said radial cut and nesting the folds of said section into preceding and following sections to form said wheel whereby each fold of said section is separately nested between the legs of a fold of an adjacent section and whereby the outside layers with cut edges are located on opposite sides of said wheel.

8. A buffing wheel composed of a plurality of sections, each of said sections formed of a disk doubled on a diameter to a half disk, said half disk radially folded in different directions to form a fold on each radial edge of said section and said sections nested with a fold of one radial section in one direction into a fold of an adjacent section and nesting another fold of said adjacent section in another direction into the fold of the other radial edge of said first section and with one half of said doubled diameter on the outside of opposite sides of said wheel.

9. A buffing wheel composed of a plurality of sections, each of said sections formed from a disk, said disk doubled to a half disk, said half disk first radially folded to a quarter disk and second the quarter disk radially folded to an eighth disk by folding the doubled edges back on opposite sides of said first radial fold, and nesting said folds into preceding and following sections to form said wheel whereby the legs of each fold of a section enclose a separate fold of an adjacent section and the said doubled edges are located on the outside of, and on opposite sides of said wheel.

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