

Dec. 13, 1938.

E. E. MURRAY

2,140,208

BUFFING WHEEL

Original Filed March 17, 1934 2 Sheets-Sheet 1

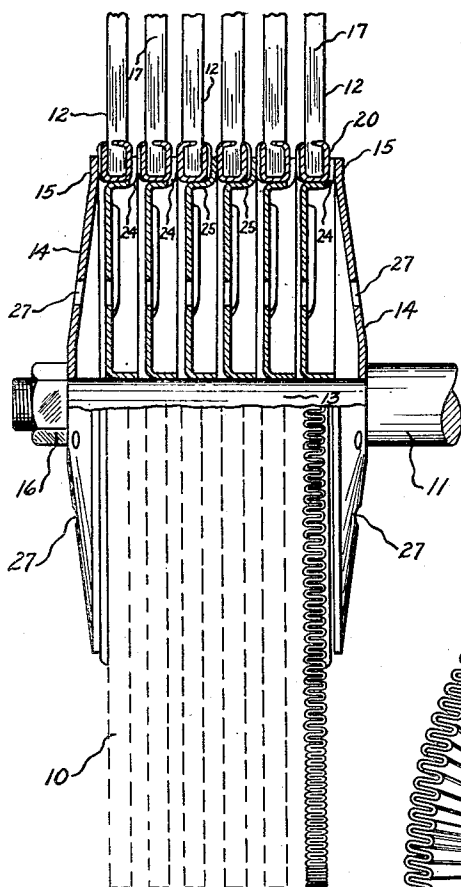


Fig. 1

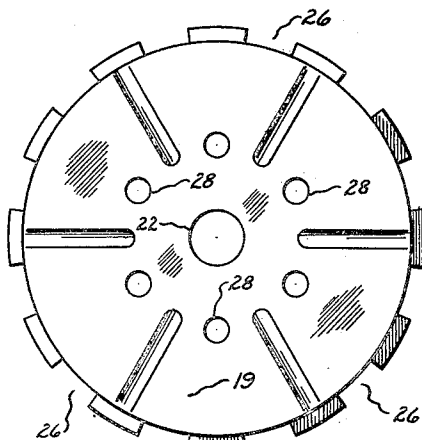


Fig. 3

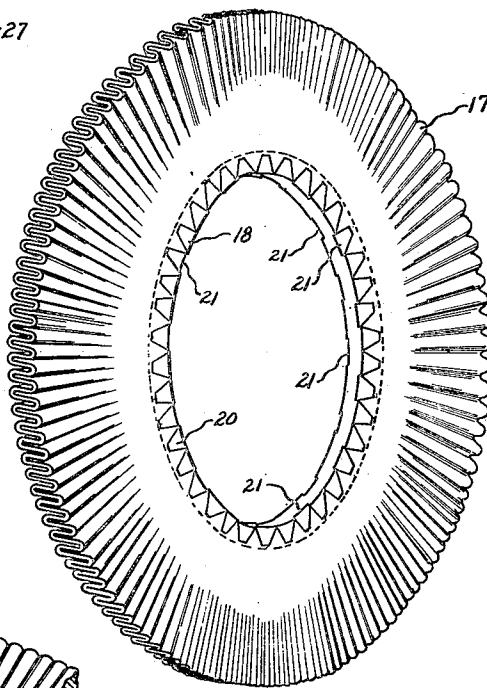


Fig. 2

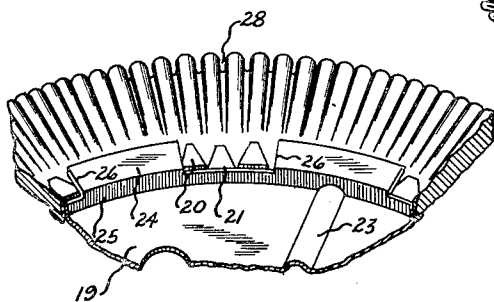


Fig. 4

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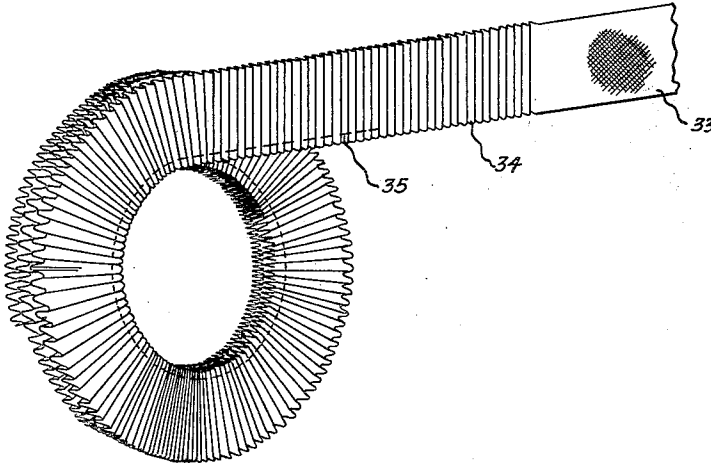


Fig. 5

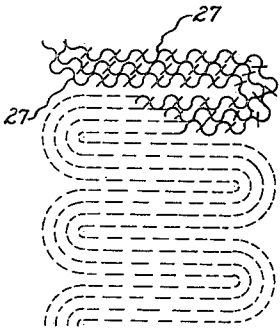


Fig. 6

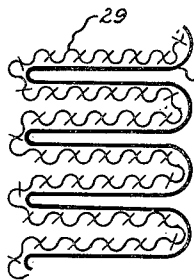


Fig. 7

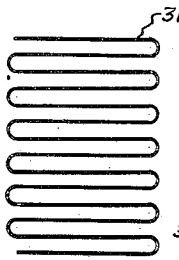


Fig. 8

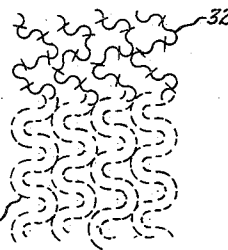


Fig. 9

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UNITED STATES PATENT OFFICE

2,140,208

BUFFING WHEEL

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Application March 17, 1934, Serial No. 716,060
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23 Claims. (Cl. 51—193)

This invention relates to improvements in buffing wheel construction and has as its primary object to provide an inexpensive, durable structure possessing improved finishing and/or cutting properties over the prior art.

Heretofore, it has been the practice in buffing wheel fabrication to build up the wheel from laminated discs or sections of fabric and/or fibrous material such as paper stock. These discs or sections have, for the most part, been so arranged that, at least during the operation of the buffing wheel, the warp and weft of the fabric or the fibre of the paper would all lie substantially in the plane of rotation. Because of their density and heat-retaining properties, buffing wheels of the aforesaid type cannot be adequately ventilated and will run hot and readily disintegrate under constant use. Beside the fibres becoming overheated and losing their tensile strength, this type of buff readily unravels at the four points where the fibres are tangent to the periphery.

The buffing wheel is primarily a vehicle for carrying the finishing and/or cutting composition which has to be replenished from time to time. To decrease the rate of wear of the buffing wheel and increase the rate of finishing and/or cutting it is important to keep the wheel impregnated with composition. It is well known to those versed in the art that the conventional buffing wheel will attain a temperature of approximately 150° F. and upward to the point of ignition. Also, the melting point of the composition used will range between 120° to 135° F. In the case of the present invention the temperature of the buffing wheel will range from 100° to 110° F. and although the composition, will melt at the point of contact with the work, because of the low temperature of the wheel, it will cool after passing this point to retain the greater portion of the composition. This is obviously not the situation with the conventional buffing wheel in which the temperature of the same is higher than the melting point of the composition.

According to the present invention, it has been discovered that if in the fabrication of the section of the buffing wheel the fabric and/or fibrous material going to make up the body is arranged in a series of radially extending folds or reverse bends presenting the greater part of the material axially of the plane of rotation, improved characteristics result. It has been found that the amount of material in the body of the buff may be materially reduced over standard practice. This is of considerable importance, especially in buffs fabricated entirely of high

grade bias cotton sheeting. Furthermore, the rate of finishing and/or cutting of buffs constructed in accordance with the invention is greater than in the case of buffs fabricated from the same material along conventional lines. Also, because of the lesser density and the presence of radially extending passages defined by the folds or reverse bends, the buff lends itself more readily to ventilation by the circulation of air drawn into the interior of the buff and directed radially outward.

Another object of the invention resides in the provision of a buffing wheel which is ventilated during operation by an air stream drawn inward and directed radially outward between the sections of the wheel and/or along the material making up the body of the wheel.

Another object is to supply a sectional ventilated buffing wheel which may be conventionally built up to any desired width or tread, the section of the wheel being centered and supported upon a spindle or mandrel or equivalent structure by improved discs permitting an air flow into the interior of the wheel and directed radially outward.

A further object resides in the manner of fabricating continuous strips of material of laminated structure or otherwise permitting the convenient coiling of the same about an inner diameter to make up a section of the buffing wheel having one or more convolutions.

There are other objects residing in the construction and arrangement and combination of the various elements which will be more fully set forth in the following specifications. The invention is clearly defined in the appended claims.

In the drawings

Fig. 1 is a side elevation of the buffing wheel mounted upon a spindle partially shown in broken section,

Fig. 2 is a perspective view of one of the sections making up the buffing wheel shown in Fig. 1 with the supporting and centering disc removed.

Fig. 3 is a side elevation of the improved supporting and centering disc for the buffing wheel section,

Fig. 4 is a fragmentary perspective view of the disc and buffing wheel section in the assembled state,

Fig. 5 is a view of the formation of the sections of the buffing wheel, and

Figs. 6 to 9, inclusive, represent certain modifications of sections of the buffing wheel.

Having specific reference to the drawings, in Fig. 1 is shown a buffing wheel 10 supported to

rotate as a unit with the spindle 11. As illustrated, the buffing wheel is built up from a plurality of individual sections 12 which are mounted upon a reduced portion 13 of the spindle 11 and held in firm assembly by enlarged washers or discs 14 engaging the sections 12 at their periphery as at 15. The end of the spindle may be threaded to receive a nut 16, which is tightened to draw the clamp through sections 12 between the washers 14.

The section 12 of the buffing wheel comprises an annular buffing surface 17, the fabrication and characteristics of which are to be hereinafter described, a metal binding ring 18, and a centering and supporting disc 19. The binding ring 18, may be identical with that included in U. S. Patent No. 1,922,108 and binds the inner edge of the annular buffing surface. As shown, the ring 18 is provided with sharpened projections 20 which are staggered upon opposite sides and bent inwardly and clamped by dies upon the inner edge. Preferably, certain of the projections 20 or localities of the binding ring 18 are coined or otherwise fabricated as at 21 to provide radially extending passages for the circulation of air through the buffing wheel. The centering and supporting disc 19 is preferably of pressed sheet metal having a flanged central aperture 22 for receiving the spindle 11 and radial stiffening ribs 23. As more clearly shown in Figs. 1 to 4, the disc 19 is provided with an off-set flange 24 and right angle circular flange 25 of a diameter enabling the disc 19 to be snugly fixed within the binding ring 18. The off-set flange 24 acts as a spacer between the sections 12 and is serrated as at 26 to provide radial passages in communication with the radial passages defined at 21 by the coined projections 20.

To enable a flow of air into the interior of the buffing wheel, the washers 14 are perforated as at 27 while the discs 19 are perforated as at 28. During the operation of the buffing wheel, air will be drawn in through the perforated washers 14 and discs 19 and expelled outwardly by centrifugal force through the aforesaid radial passages between the buffing surfaces 17 to ventilate and cool the same. The forcing of the work into the buffing wheel during use also effects a pumping action tending to provide a radial flow of air through the buffing wheel. It is to be noted that although the sections 12 are rigidly clamped between the washers 14 as at 15, the serration of the flange 25 and the coining of certain of the projections 20 as at 21 prevents any restriction to the radial flow of air through the buffing wheel.

The foregoing described structure provides a buffing wheel which may be conveniently built up in sections to any desired width. The inner diameter of the buffing surface of each section may be held to dimensions giving maximum economy of construction through the improved supporting and centering disc 19. Also, as will be readily understood, the disc 19 can be used with buffing surfaces of varying outside diameter and re-used with replacement buffing surfaces. Moreover the buffing wheel is adequately ventilated to cool the same below a temperature range at which the same is detrimentally affected and which is higher than the melting point of the conventional buffing composition.

Although the structure heretofore described is not limited to any particular buffing surface structure, the several modifications to be hereinafter described are particularly adapted to be used in combination therewith. Referring to

Figs. 2 and 6, the buffing surface 17 of each section is fabricated from a longitudinal strip of fabric 27, preferably cut upon the bias. As shown in Fig. 6 the fabric may be of more than one ply to give the required body. The fabric throughout the entire extent is provided with transversely disposed folds or return bends to locate the major portion thereof axially of the wheel instead of in the plane of rotation as is the case in buffing wheels in use at the present time. In other words, a broad side cutting and polishing action results from the arrangement shown in Figs. 2 and 6 in lieu of the "line" cutting and polishing of the conventional buffing wheel with the major portions of the body of the buffing surface located in the plane of rotation. The inner edge of the folded fabric, after being formed into an annulus, is bound by the binding ring 18 or other suitable means. As will be clear from Figs. 2 and 4 the fabrication of the buffing surface in the manner just described provides prominent radial passageways 28 facilitating cooling and ventilation of the wheel.

In the modification shown in Fig. 7, the buffing surface is fabricated in the manner heretofore described from a laminated structure of fabric 29, preferably bias cotton sheeting, and paper 30 of suitable body. In Fig. 8 is shown a further modification in which only paper 31 is employed to build up the buffing surface in the manner heretofore described. The weight and grade of the paper 30 and 31 employed will obviously depend upon the characteristics of the buffing wheel desired; generally a good grade of kraft paper, smooth or crinkle finish will fulfill the usual requirements.

In Fig. 9 is shown a buffing surface of a section of the wheel in which a plurality of fabric or fibrous strips 32 are arranged in juxtaposition. One convenient way to fabricate this modification is shown in Fig. 5 in which a strip of bias cotton sheeting, or other suitable material, is transversely folded to provide reversed bends 24, and is then spirally wound with the correct diameter to juxtapose two or more convolutions of the strip. If desired, that portion of the folded strip constituting the inner edge of the annulus may be stitched, glued or otherwise secured along the dotted line representation designated at 35. When the section has been built up to the desired thickness, the inner edge of the annulus may be bound by the employment of a binding ring 18 or other suitable means.

An annular buffing wheel section fabricated in the heretofore described manner with the major portion of the material going to make up the section extending axially of the plane of rotation has been found to have improved cutting and finishing characteristics. Moreover, adequate body in the buffing wheel section may be built up with a substantial saving in the amount of material used over prior practices.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A buffing wheel comprising a plurality of annular buffing sections of flexible material having the inner edges thereof reinforced by metallic binding rings, a rotatable spindle, discs located upon said spindle having peripheral flanges over which said rings are removably received for centering and supporting said sections, and means for clamping said section and disc upon said spindle for rotation therewith as a unit.

2. A buffing wheel comprising a plurality of annular buffing sections of flexible material hav-

ing the inner edges thereof reinforced by metallic binding rings, a rotatable spindle, perforated discs located upon said spindle upon which said sections are centered and supported, means associated with said discs for spacing said sections to provide radial air passages, means for clamping said sections and discs upon said spindle for rotation therewith as a unit, said means having air passages therethrough communicating with the inner ends of said radial passages.

3. A sectional ventilated buffing wheel comprising a plurality of annular buffing sections of flexible material having the inner edges thereof reinforced, a spindle, perforated discs located upon said spindle upon which said sections are centered and supported, means associated with said discs for spacing said sections to provide radial air passages therebetween, and means for clamping said sections and discs upon said spindle as a unit, said means having air passages therethrough communicating with the inner ends of said radial passages.

4. A sectional ventilated buffing wheel comprising a plurality of annular buffing sections of flexible material, means for reinforcing the inner edges of said sections providing radial passages, a spindle, perforated discs located upon said spindle, a laterally offset continuous flange on each of said discs upon which said sections are centered and supported, means associated with said discs for spacing said sections to provide radial air passages communicating with said first passages, and means for clamping said sections and discs upon said spindle as a unit, said means having air passages therethrough communicating with the inner ends of said radial passages.

5. A sectional ventilated buffing wheel comprising a plurality of annular buffing sections of flexible material, centering and supporting discs having peripheral flanges on which the inner edges of said sections are received and supported, means associated with said discs for providing radial air passages between adjacent sections and means defining passages to admit air into the interior of the wheel to pass outwardly through said passages.

6. A sectional buffing wheel comprising a plurality of annular buffing sections of flexible material arranged side by side, a spindle, a metallic disc constituting a removable core associated with each of said sections for centering and supporting the same upon said spindle, each disc having a peripheral flanged portion extending radially and between adjacent buffing sections to space the same, the configuration of said flanges and adjacent sections defining radial air passages between said sections, means for clamping said sections and discs together as a unit upon said spindle, the clamping action of said means being effective at the inner periphery of said sections and through said flanged portions, and means providing ingress of air into the interior of said wheel.

7. In a sectional ventilated buffing wheel a plurality of annular buffing sections of flexible material arranged side by side, a metallic disc constituting a removable core associated with each of said sections, and a serrated flange associated with each disc spacing adjacent sections to provide radial air passages.

8. In a sectional ventilated buffing wheel, a plurality of annular buffing sections of flexible material arranged side by side, a relatively rigid disc constituting a removable core associated with each of said sections, said discs being of less thick-

ness than said sections, thus defining a plurality of spaces, means associated with each disc for spacing the adjacent sections of said wheel, the configuration of said means and each adjacent section defining radial air passages communicating with said spaces.

9. In a sectional ventilated buffing wheel, a plurality of annular buffing sections of flexible compressible material arranged side by side, relatively rigid means reinforcing the inner periphery of said sections, a relatively rigid disc constituting a core associated with each of said sections, said discs being of less thickness than said sections, thus defining a plurality of spaces, means associated with each disc for spacing the adjacent sections of said wheel, the configuration of said last means and said reinforcing means defining radial air passages between said sections communicating with said spaces.

10. In a sectional buffing wheel, an annular buffing section of flexible material having the inner periphery thereof reinforced, a relatively rigid disc constituting a core for said section for centering and supporting the same, said disc having a peripheral transverse flange over which the said inner periphery is received and a radial off set flange extending along one side of said section contiguous with said inner periphery.

11. In a sectional buffing wheel, an annular buffing section of flexible material having the inner periphery thereof reinforced, a relatively rigid disc constituting a core for said section for centering and supporting the same, said disc having a peripheral transverse flange over which the said inner periphery is received and a radial offset serrated flange extending along one side of said section contiguous with said inner periphery to provide radial passages.

12. In a buffing wheel, an annular buffing section comprising a longitudinal strip of flexible material folded transversely to provide a series of closely disposed reversed bends, said folded strip being coiled upon itself to form a multi-ply structure, a major portion of said strip extending axially of said section.

13. A buffing wheel comprising a plurality of annular sections arranged side by side, a rotatable spindle, centering and supporting discs located on said spindle, said discs being of less thickness than said sections, each having a peripheral lateral offset continuous flange upon which said sections are mounted and means for clamping said sections and discs upon said spindle for rotation therewith as a unit.

14. In a buffing wheel, an annular buffing section comprising a longitudinal strip of bias fabric disposed in annular form and having flexible paper associated therewith in contacting supporting relationship.

15. In a buffing wheel, an annular buffing section comprising a longitudinal strip of bias fabric disposed in annular form, and a longitudinal strip of paper likewise disposed in annular form and associated with said fabric in contacting supporting relationship.

16. In a buffing wheel, an annular buffing section comprising a longitudinal strip of fabric disposed in annular form having outer and inner peripheral edges, the outer peripheral edge of said strip in the section defining a sinuous path whereby line cutting is avoided, the inner peripheral edge of said strip being likewise sinuous and permanently maintained in such a state by sewing and the major portion of the fabric being

disposed substantially parallel to the axis of rotation of the section.

17. In a buffing wheel, an annular buffing section comprising a longitudinal strip of fabric disposed in annular form having outer and inner peripheral edges defining sinuous paths produced by radially extending folds, and means binding the section adjacent the inner edge to provide a self-sustained unit and to maintain the curvilinearity of said strip, and the major portion of the fabric being disposed substantially parallel to the axis of rotation of the section.

18. In a buffing wheel, an annular buffing section comprising a longitudinal strip of fabric disposed in annular form having outer and inner peripheral edges defining sinuous paths produced by radially extending folds, paper associated with said fabric in contacting supporting relationship, and the major portion of the fabric being disposed substantially parallel to the axis of rotation of the section, and means binding the fabric and paper adjacent the inner edge to provide a self-sustained unit and to maintain the curvilinearity of said strip.

19. In a buffing wheel, an annular buffing section comprising adjacently disposed strips of fabric and paper in contacting and supporting relationship, the peripheral edges of said fabric and paper strips defining interlocked sinuous paths to dispose axially of the wheel a substantial portion of said strips whereby line cutting of the work is avoided and the major portion of the fabric being disposed substantially parallel to the axis of rotation of the section.

20. In a sectional ventilated buffing wheel, a plurality of buffing sections arranged side by side, disc like members associated with said sections, said members each having a central opening for receiving a mounting spindle, peripheral portions of said members being located between adjacent buffing sections for spacing the same, axially extending openings defined by said members, radially spaced from said central openings, said buffing sections being apertured in an area extending radially from the mounting spindle to provide openings axially aligned with said openings in said members whereby an unobstructed axially extending air passage is provided through the interior of the buffing wheel and spaced from the mounting spindle, the spacing of said sections by said members providing a radial air passage between adjacent buffing sections, said axially extending passage communicating with said radial

air passage whereby air may flow into the interior of the wheel and be expelled radially outward between adjacent buffing sections.

21. In a sectional ventilated buffing wheel, a plurality of buffing sections arranged side by side, section supporting disc-like members associated with said sections, said members each having a central opening for receiving a mounting spindle, portions of said members being located between said sections to space adjacent sections to provide a radially extending air passage therebetween, axially extending openings defined by said members, radially spaced from said central openings, said buffing sections being apertured in an area extending radially from the mounting spindle to provide openings axially aligned with said openings in said members whereby an unobstructed axially extending air passage is provided through the interior of the buffing wheel and spaced from the mounting spindle, said members being of a configuration providing an air passage between adjacent buffing sections communicating with said axially extending passage and said radial air passage whereby air flows into the interior of the wheel and is expelled radially outward between adjacent buffing sections.

22. As a new article of manufacture, a buffing disk comprising a relatively thin center portion provided with a central opening, and a relatively thicker annular portion about said center portion and having an annular zone which is provided with one or more passages leading outwardly from said center portion.

23. In a sectional ventilated buffing wheel, a plurality of buffing sections arranged side by side and each section comprising an annular portion of soft buffing material and a disc portion extending inwardly from said annular portion of soft buffing material a substantial distance, said disc portion being arranged in the same plane as the annular portion and centrally perforated to receive a mounting spindle so as to support and center said annular portion thereon, said disc portion serving to space from each other the opposed faces of said annular portions to permit the passage of air therebetween, and air holes penetrating said sections to admit air in an axial direction, said holes being spaced from the mounting spindle and from the outer periphery of said sections whereby air flows into the interior of the wheel and is expelled outwardly between the sections.

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