Jan. 15, 1952 L. B. SAX ET AL 2,582,506

BUFFING WHEEL

Filed June 28, 1949 2 SHEETS—SHEET 1

Fig. 1.

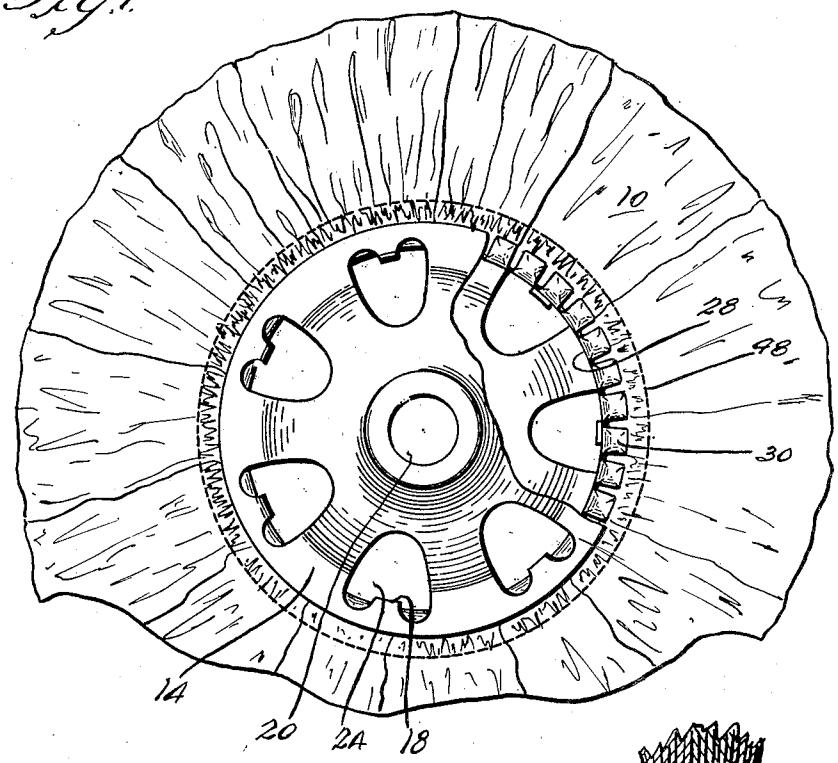


Fig. 2.

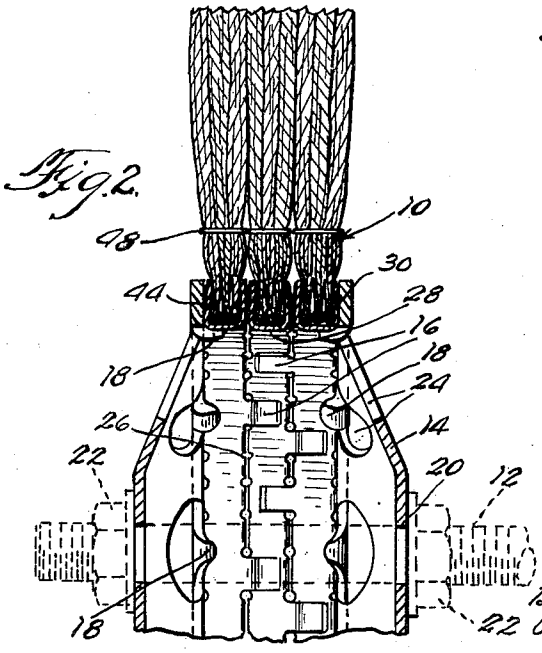
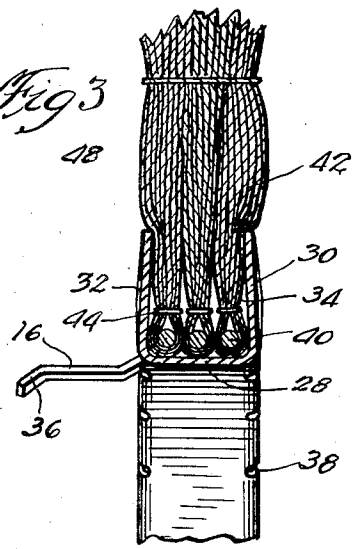


Fig. 3



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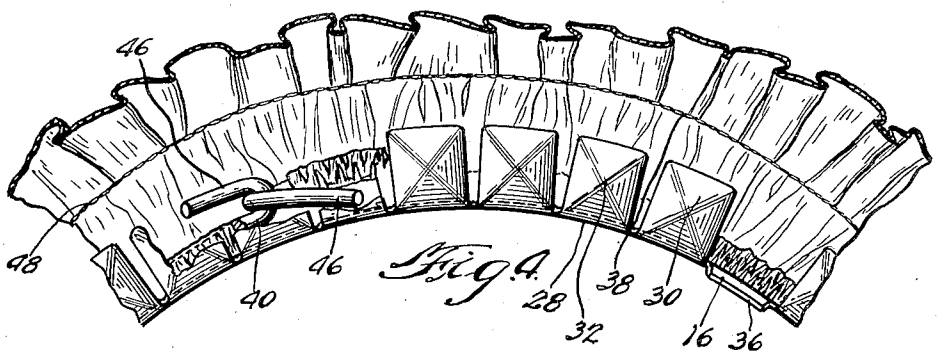


Fig. 4.

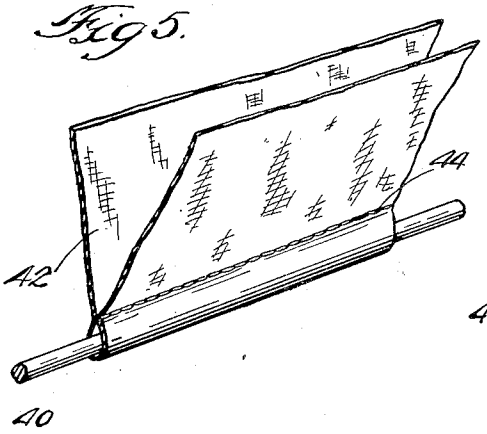


Fig. 5.

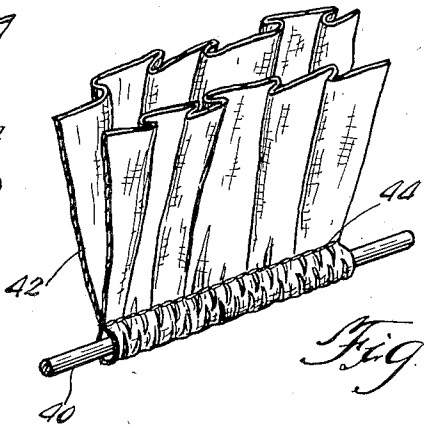


Fig. 6.

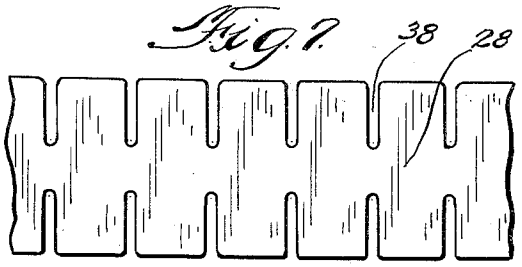


Fig. 7.

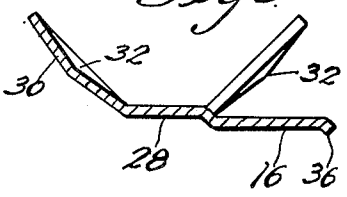


Fig. 8

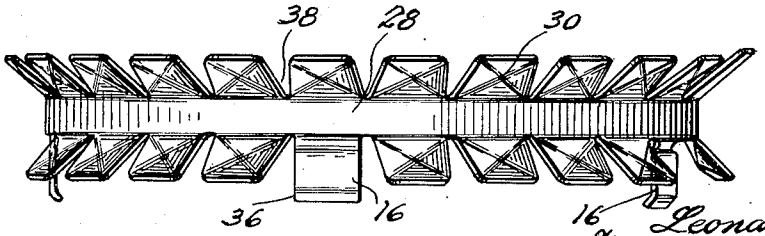


Fig. 9.

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BUFFING WHEEL

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Application June 28, 1949, Serial No. 101,812

16 Claims. (Cl. 51—193)

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This invention relates to buffing and has for an object the provision of buffing wheels and buffing sections.

In the buffing art it has been the usual practice to form various types of buffing wheels from a plurality of fabric discs or buffing sections which contain a considerable quantity of unusable fabric in a central portion of each disc or section. That is, when a buffing wheel of this character has been reduced in size because of use, there is a substantial amount of useful fabric in the central area of each disc or section which has not been used and which is functionless except for the purpose of spacing the outer peripheral areas of the buffing wheel from the arbor or spindle upon which the wheel is supported. In order to remedy this situation it has been proposed in the past to prepare buffing wheels and buffing wheel sections in which the fabric extends only around the outer areas of the wheel and in which the wheels or sections are either centerless or provided with centers of wood, stiff cardboard or other material. Buffing wheels and buffing sections of the centerless type have not been entirely satisfactory, however, since no means has heretofore been provided for permitting them to be readily mounted on a suitable arbor without the use of auxiliary clamping bolts and other auxiliary securing means. A further difficulty with buffing wheels and buffing sections of the prior art and particularly those of the centerless type is that often the wheels or sections have a tendency to disintegrate during high speed buffing operations and obviously this characteristic is extremely undesirable.

Accordingly it is one object of this invention to provide a buffing section of the centerless type which may be readily assembled between a pair of clamping plates on an arbor to form a desired buffing wheel.

A further object of this invention is the provision of a centerless buffing wheel which will not have a tendency to disintegrate during high speed buffing operations.

A still further object of this invention is the provision of a buffing wheel which has an extremely rapid cutting action and which at the same time is internally air-cooled in order to prevent the fabric of the buffing wheel from overheating during use.

A still further object of this invention is the provision of a buffing section which may be assembled with any reasonable number of identical buffing sections between a pair of clamping

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plates on an arbor to provide a buffing wheel of any desired size.

Further objects of this invention will appear from the following description, the accompanying drawings and the appended claims.

In carrying out this invention in one form there is provided a centerless buffing section comprising a flat strip bent in the form of a circular band having inner and outer peripheral surfaces. Buffing means are secured to the band and extend from the outer surface thereof, and a plurality of peripherally spaced tongues or tab portions integral with the band are provided which extend in a substantially axial direction from at least one edge of the band. These tongues or tab portions are positioned and arranged in such a manner that they are adapted to engage the inner surface of an annular strip or band of a similar adjacent buffing section. Thus by the provision of these interlocking tongues or tabs it is possible to arrange any reasonable number of centerless buffing sections in closely adjacent coaxial relationship and the tongues will hold them in this relationship on an arbor when they are mounted between suitable clamping plates.

In accordance with a preferred embodiment of the invention, the annular band supporting the buffing element or elements may take the form of an outwardly facing channel, the side walls of which comprise a plurality of radially extending tongues integral with the band. The buffing element itself preferably takes the form of a strip of fabric gathered on a supporting strand or wire and wrapped spirally within the channel in order to provide a buffing ring extending peripherally from the outer surface of the band. The radially extending tongue members may be separated by slots and these slots may extend into the inner and outer surfaces of the band, thereby forming radial air passageways for cooling the buff when a plurality of the buffing sections are assembled as a buffing wheel. As will be apparent as the description proceeds, it is preferred that the interlocking tongues or tab members for each buffing section be circumferentially spaced around the strip or band and that they be formed similarly to the radially extending, channel forming tongues or tabs. If desired, the axially extending interlocking tongues may be provided with inwardly bent end portions to permit the ready assembly of a plurality of the buffing sections and the radially extending tongue members may be provided with suitable deformations in the outer faces thereof to cooperate with similar deformations on the tongues or tabs of

an adjacent section to insure that the sections when clamped together will rotate as a unit in the buffing wheel.

In the assembly of the buffing wheel from the buffing sections constructed in accordance with this invention, it is preferred to employ a pair of relatively heavy clamping plates between which the buffing sections are mounted. These clamping plates are also provided with a plurality of axially extending, circumferentially spaced tongue members so that an adjacent buffing section may be supported thereon by the engagement of said tongues with the inner surface of the ring or band of the section. The tongues or tabs on the clamping plate are preferably struck or formed from apertures within the clamping plate, the apertures providing means for permitting the circulation of air into the center of the assembled buffing wheel which may then be readily discharged through the above referred to radial passageways between the buffing sections.

For a more complete understanding of this invention, reference is now made to the accompanying drawings, wherein

Fig. 1 is a broken side view of a buffing wheel constructed in accordance with one embodiment of this invention;

Fig. 2 is a partial sectional view of the wheel shown in Fig. 1 mounted on a suitable arbor or spindle, the latter being shown in dotted lines;

Fig. 3 is an enlarged detail sectional view of a buffing section employed in assembly of the buffing wheel shown in Figs. 1 and 2;

Fig. 4 is a detail view with parts broken away of the buffing section shown in Fig. 3;

Figs. 5 and 6 are perspective views indicating the manner in which a buffing fabric may be assembled on a suitable strand or wire prior to the time that it is wound on the circular support band of the buffing section;

Fig. 7 is a plan view of the flat strip for supporting the buffing element of the buffing section prior to the time that the strip is formed into a circular band or an annulus; and

Figs. 8 and 9 are sectional and elevational views, respectively, of the circular strip for the buffing section in an intermediate stage of formation.

With particular reference to Figs. 1 and 2, the buffing wheel constructed in accordance with one embodiment of this invention comprises a plurality of centerless buffing sections 10 mounted on an arbor 12 and secured thereto between a pair of clamping plates 14. It will be noted that the buffing sections 10 are entirely centerless in character and are secured in coaxial relationship by means of a plurality of tongues or tabs 16 which extend axially thereof and underlie the inner surface of an adjacent buffing section. The buffing sections 10 are held in coaxial relationship to the clamping plates 14 and the arbor 12 by means of a plurality of tongue members 18 circumferentially spaced around each of the clamping plates 14 and also engaging the inner peripheral surfaces of the buffing section at each end of the wheel assembly. The clamping plates 14 each include a central aperture 20 through which the arbor 12 extends. The clamping plates are tightly secured to the arbor 12 and in firm engagement with the buffing sections 10 by means of suitable bolts 22 threaded on the arbor. The clamping plates 14 also include a plurality of apertures 24 from which the tongues 18 may be struck. The apertures 24 provide means for permitting air to be drawn into the central portion of the buffing wheel and discharged therefrom during the buffing operation in a radial direction between the buffing elements 10 and through passageways 26 formed by slots in the buffing section hereinafter to be described.

With particular reference to Figs. 3 and 4, the buffing section of this invention in one form comprises a flat strip 28 in the form of a circular band having an inner surface and an outer surface. Integral with the strip 28 are a plurality of radially extending tongues 30 having roof-shaped deformations 32 and providing in cooperation with the band 28 an outwardly facing annular channel 34 which is adapted to receive the inner peripheral edge of a ring-shaped buffing element. The deformations 32 in the tongue or tab members 30 may serve in part to prevent the relative rotation of several buffing sections when the same are mounted on an arbor between clamping plates. Certain tongue members 16 circumferentially spaced around the periphery of the strip or band 28 are bent in a direction substantially axial of the buffing section and these tongues or tabs 16 are provided with an inwardly turned end portion 36 to readily facilitate the placement of a similar buffing element adjacent thereto in the manner indicated in Fig. 2. It will be noted that the over-all lengths of tongues 16 are somewhat less than the width or thickness of the adjacent buffing element so that the tongues in cooperation will firmly engage the adjacent buffing section but will not extend therebeyond. In this connection it will be noted that two of the buffing sections in Fig. 2 are shown with the tabs or tongues 16 extending to the right. However, the buffing section 10 furthest to the right has been turned over so that its interlocking tongues or tabs 16 extend to the left. Thus no tabs 16 project through the clamping plates 24 although the apertures 24 in the plates may be arranged to receive such tongues if so desired. It will be noted in the embodiment shown that the right-hand buffing section in Fig. 2 is the same as the center and left-hand sections and it is not necessary to have a special section at the end of the buffing wheel since it is only necessary to reverse or turn this one over so that the tongues project in the opposite direction if it is not desired to have them extend through apertures on the clamping plate 14.

Referring back to Figs. 3 and 4, it will be noted that slots 38 are provided between the tab or tongue members 30 and that these slots extend into the main body portion 28 of the annular band or strip. Thus, when a plurality of the sections are assembled into a wheel as indicated in Fig. 2, there are provided a plurality of openings 26 through which cooling air may circulate radially when the buffing wheel is in operation as above described.

The buffing element included in the buffing section as shown in the drawings comprises a plurality of layers of fabric, preferably cut on the bias, as well known to the art, and spirally wound in the shape of a ring or annulus. These layers are spirally wound around the strip 28 within the channel 34 employing a wire or other suitable strand 40 as a support. As indicated in Figs. 5 and 6, it is preferable to secure a strip of folded fabric 42 in one or more layers to the wire or strand 40 by suitable stitching 44 and thereafter pass the wire and fabric through a gathering machine wherein the fabric 42 is gathered on the wire 40 in the manner indicated in Fig. 6. After

the gathering operation has been completed, then the wire and fabric are spirally wound within the peripheral channel 34. After the winding has been completed, the ends 46 of the wire 40 (see Fig. 4) are looped about each other within the channel 34 in order that the buffing fabric 42 will be securely retained therein. It will be apparent that other means may be provided for retaining the opposite ends of the wire 40 but the method disclosed is presently preferred where the wire is sufficiently stiff to permit of securement by this means and where it is desired not to have ends of the wire exposed on the side of the buffing section.

In order to form the annular strip or buff element supporting means including the channel forming tabs or tongues 30 and the interlocking tabs or tongues 16, there is provided a flat blank of metal or other suitable material having the configuration indicated in Fig. 7. The tongue members 30 and 16 are bent into the positions indicated in Figs. 8 and 9, tongue members 16 being offset slightly inwardly from the main body portion 28 of the strip, and tongue members 30 being flared outwardly from the strip at an angle of about 45 degrees. At the same time the roof-shaped deformations 32 are provided in the tongues or tabs 30 and the bent-over end portions 36 are provided in the tongues 16. The thus formed strip may then be bent into the form of a band or annulus as indicated in Fig. 9 and the ends are secured as by welding or otherwise. Thereafter the fabric 42 gathered on the wire or other strand 40 in the manner indicated above is wound about the outer surface of the strip 28 within the channel 34. After this spiral winding operation has been completed and the ends 46 of the wire 40 have been secured together, the tongues 30 are then bent into a substantially radially extending direction as most clearly shown in Figs. 3 and 4. Then a peripheral row of stitching 48 is applied to secure the several layers of fabric of the section together. The resulting section is useful for assembling a buffing wheel on an arbor as previously described.

It will thus be apparent that a buffing wheel section has been provided which may be readily manufactured and which may be easily assembled to form a useful buffing wheel. The sections and resulting wheel are extremely durable and the wheel is capable of a fast cutting action, it being noted that substantial means are provided for circulating air between the several buffing sections by means of the apertures 24 and 26. The buffing wheel has the further advantage that it does not have a tendency to channel or separate because of the spiral winding of the buffing fabric on the several buffing sections. The deformations 32 may provide means for preventing relative rotation of the several sections about the arbor. However, the compression of the fabric buffing elements when the sections are clamped together also acts in a similar manner.

While in the foregoing there has been described a particular means for mounting the buffing elements adjacent the outer surface of the strip 28, it will be apparent that other means may be employed if desired. For example, the wire or strand 40 may be dispensed with and the fabric 42 may be clamped between suitable inwardly turned prongs or teeth formed on the ends of tongues 30 if desired. Likewise other means will suggest themselves for mounting the buffing element or other buffing elements adjacent the outer surface of the strip 28, a particularly important feature

of this invention being the provision of a centerless buff held together in interlocking relationship by means of tabs or tongue members integral with and extending axially of a strip on which the buffing elements are mounted.

While a particular embodiment of this invention is shown above, it will be understood, of course, that the invention is not to be limited thereto, since many modifications may be made, and it is contemplated, therefore, by the appended claims, to cover any such modifications as fall within the true spirit and scope of this invention.

We claim:

1. A centerless buffing section comprising an annular strip having inner and outer cylindrical surfaces, a plurality of layers of buffing fabric gathered on a supporting strand and wound spirally in the form of a ring extending outwardly from the outer peripheral surface of said strip, a plurality of tongue members extending outwardly from the opposite edges of said strip defining said surfaces and cooperating with said strip to form a circular channel within which said strand and said buffing fabric are received, and a plurality of spaced tongue members integral with said strip extending in a direction axially thereof, said tongue members being offset inwardly adjacent their respective bases and providing outer faces adapted to underlie and engage the inner surface of a similar adjacent buffing section.

2. A centerless buffing section comprising a flat strip in the form of an annular band having inner and outer cylindrical surfaces and opposing side edges, a plurality of closed spaced tongue members integral with said strip extending radially outwardly from said opposing side edges and having slots therebetween, said slots extending into the cylindrical surfaces of said strip providing radial air passageways for said buffing section, a supporting strand wound in the form of a spiral around the outer surface of said strip lying within the channel formed by said strip and said tongue members, a spirally wound layer of fabric gathered on and supported by said strand forming the buffing element for said section, and a plurality of spaced interlocking tongue members also integral with said strip extending in a direction axially thereof adapted to underlie and engage the inner surface of a similar adjacent buffing section.

3. The buffing section recited in claim 2 wherein said first mentioned tongues have outwardly extending deformations formed in the outer faces thereof adapted to cooperate with similar deformations on the corersponding tongues of said adjacent buffing section to prevent relative axial rotation when said sections are clamped together.

4. A buffing wheel including a center arbor, a pair of clamping plates supported on said arbor, a plurality of centerless buffing sections each comprising a buffing element and a ring-shaped buffing element support means having an inner peripheral surface spaced from said arbor, and a plurality of circumferentially spaced tongue members on said support means and said plates underlying and engaging said inner surfaces of adjacent support means whereby said plates and said sections are held in coaxial relationship on said arbor, said tongue members constituting the sole means in the space between said arbor and said inner surface for supporting said buffing sections.

5. A buffing wheel including a center arbor, a pair of clamping plates supported on said arbor, a plurality of centerless buffing sections coaxial with said arbor and plates and each comprising an annulus having an inner peripheral surface spaced from said arbor and an outwardly facing peripheral channel and a ring-shaped buffing element having its inner edges spirally wound and secured within said channel, a plurality of circumferentially spaced tongue members integral with each buffing section extending therefrom in an axial direction and out of the plane thereof upon which an adjacent annulus is supported on its inner surface, and a plurality of additional circumferentially spaced tongue members integral with each clamping plate extending axially therefrom upon which an adjacent annulus is supported on its inner surface, said tongue members comprising the sole means in the space between said annulus and said arbor by which said sections are maintained in coaxial relationship on said arbor.

6. The buffing wheel recited in claim 5 wherein said peripheral channel comprises a main body portion in the form of a band and wherein the sides of said channel comprise tongue members integral with said main body portion and bent into a plane substantially perpendicular to the axis of said wheel, said last mentioned tongue members having outwardly extending deformations projecting from the outer surfaces thereof interlocking to prevent relative axial rotation of said buffing sections.

7. A buffing wheel including a center arbor, a pair of clamping plates, a plurality of buffing sections each comprising a buffing element and a ring-shaped buffing element support means having an inner peripheral surface spaced from said arbor, and a plurality of circumferentially spaced tongue members on said support means and said plates for underlying and engaging said inner surfaces of adjacent support means whereby said plates and said sections are held in coaxial relationship on said arbor, said tongue members constituting the sole means in the space between the arbor and said inner surface for supporting said buffing sections, said tongue members on said plates being struck from said plate to define air circulating apertures therein spaced radially inwardly from said tongue members and said support means having radially extending air passageways therebetween.

8. A buffing section comprising a cylindrical band defining the inner peripheral edge of the section and having inner and outer cylindrical surfaces, a ring-shaped buffing element forming the main body of the section and having its inner peripheral edge secured to said band adjacent the outer surface thereof, and a plurality of circumferentially spaced tab members integral with said band and extending out of the plane thereof in an axial direction, said tab members being offset inwardly adjacent their respective bases and providing outer faces adapted to engage the inner surface of a cylindrical band of an identical adjacent buffing section.

9. A centerless ring-shaped buffing section comprising a cylindrical band defining the inner peripheral edge of the section and having inner and outer cylindrical surfaces, a ring shaped buffing element forming the main body of the section and having its inner peripheral edge secured to said band adjacent the outer surface thereof, and a plurality of circumferentially spaced tab members integral with said band and extending perpendicularly out of the plane of said section, said tab members being offset inwardly adjacent their respective bases and providing outer faces lying within the cylinder defined by the inner surface of said band.

10. A buffing wheel including a central arbor, a pair of clamping plates supported on said arbor, a plurality of buffing sections each comprising a buffing element and a ring-shaped buffing element support means having an inner peripheral surface spaced from said arbor, and a plurality of circumferentially spaced tongue members attached to said buffing element support means underlying and engaging said inner surfaces of adjacent buffing element support means whereby said sections are held in coaxial relationship with each other on said arbor, said tongue members constituting the sole means in the space between said arbor and said inner surfaces for holding said sections in said coaxial relationship.

11. A buffing wheel including a central arbor, a pair of clamping plates supported on said arbor, a plurality of centerless buffing sections each comprising a buffing element and a ring-shaped buffing element support means having an inner peripheral surface spaced from said arbor, an annularly arranged buffing section support means integral with each plate radially spaced from said center arbor and engaging the inner peripheral surface of an adjacent buffing element support means, and a plurality of circumferentially spaced tongue members attached to said buffing element support means underlying and engaging said inner surfaces of adjacent buffing element support means whereby said sections are held in coaxial relationship on said arbor, said tongue members and said buffing section support means on said plates constituting the sole means in the space between said arbor and said inner surfaces for holding said sections in coaxial relationship.

12. The buffing wheel recited in claim 11 wherein said tongue members are inwardly offset from the support means to which they are attached.

13. A buffing wheel including a center arbor, a pair of clamping plates supported on said arbor, a plurality of buffing sections each comprising a ring-shaped buffing element and a cylindrical buffing element support means having inner and outer surfaces adjacent the inner peripheral surface of said element, a plurality of closely spaced tongue members extending radially outwardly from said outer surface forming a buffing element-receiving channel, said tongue members being separated by slots extending through said cylindrical, inner and outer surfaces providing radially extending air passageways, and a plurality of circumferentially spaced interlocking tongue members extending in an axial direction from each of said buffing element support means and underlying and engaging the inner surface of an adjacent buffing element support means whereby said buffing sections are maintained in coaxial relationship between said plates.

14. A buffing section comprising an annular strip having inner and outer cylindrical surfaces and opposing side edges, a plurality of closely spaced tongue members integral with said strip extending radially outwardly from said opposing side edges forming a buffing element receiving channel and having slots therebetween, said slots extending into the cylindrical surfaces of said strip providing radial air passageways for said buffing section, a ring-shaped fabric buffing element having its inner peripheral edge received

in said channel, and a plurality of circumferentially spaced tongue members also integral with said strip extending in an axial direction adapted to underlie and engage the inner surface of the strip of a similar adjacent buffing section.

15. The buffing section recited in claim 14 wherein said last-mentioned tongue members are offset inwardly adjacent their base and present faces defining a cylinder coincident with the cylinder defined by the inner surface of said strip.

16. The buffing section recited in claim 15 wherein said last-mentioned tongue members have inwardly turned end portions to facilitate the interlocking engagement of said buffing section with said adjacent buffing section.

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