June 10, 1952 B. P. SAX 2,599,785

BUFFING

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Fig. 1

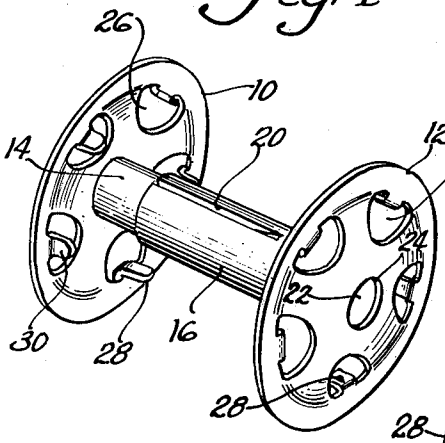


Fig. 2

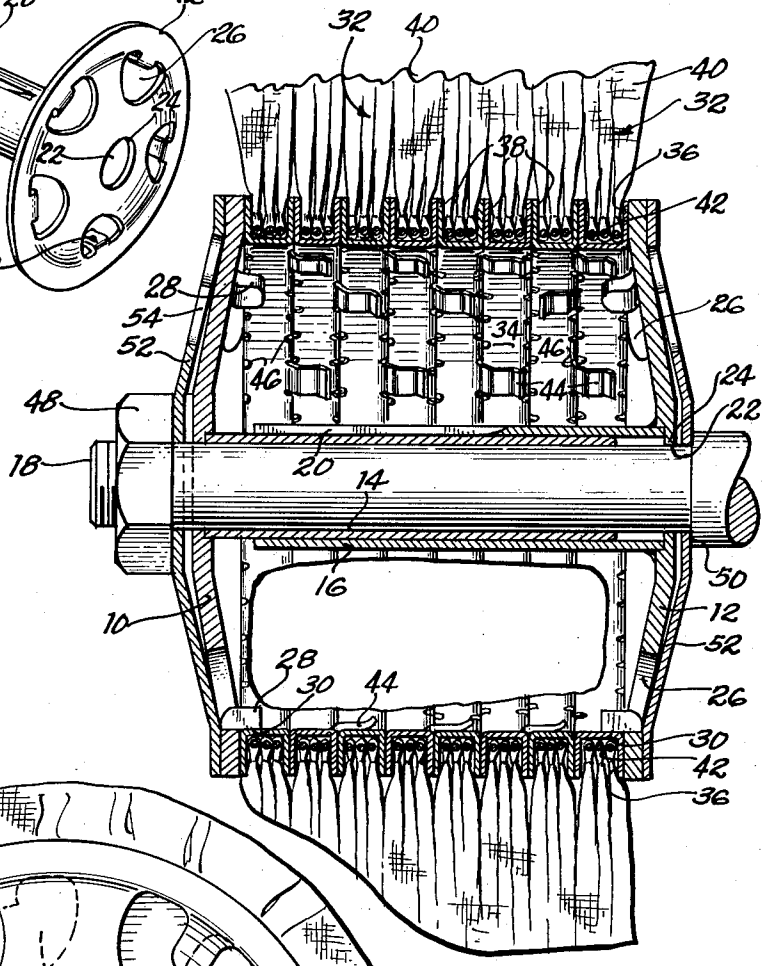
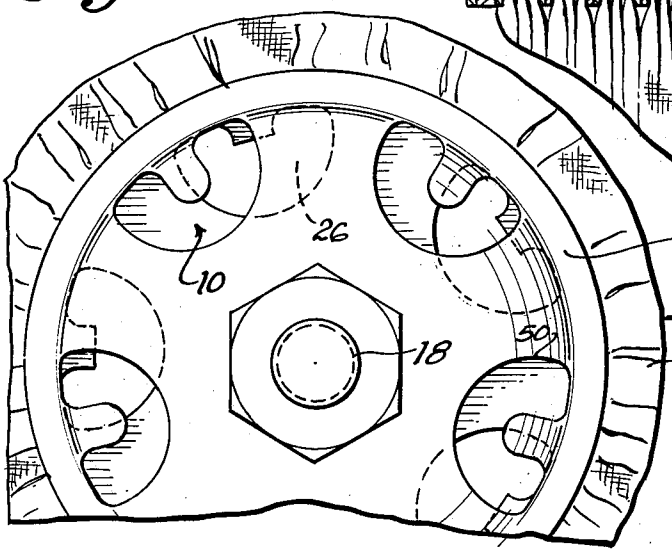


Fig. 3



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BUFFING

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15 Claims. (Cl. 51—193)

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This invention relates to buffing and has for an object the provision of a buffing wheel assembly and a hub mounting for a buffing wheel assembly.

In the art of buffing it has previously been proposed to prepare buffing wheel assemblies which comprise a plurality of centerless buffing sections clamped between a pair of flanges or discs and supported on a suitable spindle. Centerless buffing sections for buffing assemblies of this character have been and are being widely used, first, because the centerless feature of such assemblies provides means for permitting the ready circulation of air through the buffing assembly, and, second, the centerless sections materially cut down on the amount of fabric that need be employed in the manufacture of the individual sections. In the usual type of full-center buffing section there is a large amount of unused fabric which must be discarded or reclaimed after the buffing wheel assembly has become sufficiently worn so that it is no longer fully effective on the buffing machine. This disadvantage is overcome by the use of centerless buffing sections comprising an annulus or ring of fabric supported on a metallic centerless ring in the manner disclosed in the copending application of Leonard B. Sax and Thomas H. Kingsbury, Serial No. 101,812, filed June 28, 1949 which issued as Patent No. 2,582,506, dated January 15, 1952.

One difficulty with buffs of the centerless type, and indeed with buffs of any type, is that when they become sufficiently worn they must be replaced. This replacement entails closing down the machine, dismantling the buffing wheel, and individually removing and reinserting onto the wheel the plurality of buffing sections that are employed to build up the complete assembly. Thus when a buffing wheel is to be changed there is considerable lost time involved, not only in so far as the operator is concerned, but also in so far as those personnel are concerned whose activity is dependent upon the amount of work being passed to the buffing wheel.

It is therefore one object of this invention to provide a buffing wheel which may be rapidly assembled on a machine spindle with a minimum loss of time.

A further object of this invention is the provision of a hub mounting for a buffing wheel assembly which may be employed to hold a plurality of centerless buffing sections in assembled relationship independently of the machine spindle so that the buffing sections may be preassembled on the hub by relatively low cost labor

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whereafter the resulting hub unit and buffing wheel sections can be rapidly installed on the spindle of a machine when it becomes necessary to effect a change.

A still further object of this invention is the provision of an adjustable hub mounting for a plurality of centerless buffing elements which may be adjusted to accommodate within limits any desired number of buffing sections thereon.

A still further object of this invention is the provision of a centerless buffing wheel assembly in which the circulation of air therethrough can be controlled.

Further and additional objects of this invention will become apparent from the following specification, the accompanying drawing, and the appended claims.

In accordance with one embodiment of this invention there has been provided a hub mounting which includes a pair of telescopically engaged tubular members having a pair of clamping plates or discs secured to the opposing ends thereof for embracing a buffing element or a plurality of centerless buffing sections therebetween. The flanges are provided with a plurality of spaced tongues which extend toward each other on each plate and are adapted to engage the inner peripheral edge of a ring-shaped, centerless buffing section. In accordance with one embodiment of the invention the element engaging tongues on the discs or flanges are struck out from the main body portion of the flanges themselves, thus in part providing apertures through which air is drawn into the central portion of the buff assembly. Likewise, the buffing element or the plurality of buffing sections embraced between the flanges are provided with means defining radially extending passageways for discharging air through the buffing element during operation.

In certain types of centerless buffing wheel assemblies it has been found desirable to provide means for circulating air therethrough in order to cool the fabric while it is being used. On the other hand, it is not desired to pass too much air through the buffing wheel, since a forced draft or wind is set up which is objectionable to the operator. Accordingly, in accordance with one embodiment of this invention means have been provided for controlling the amount of air which may be circulated through the buffing assembly during operation. Such means may include a supplemental flange or disc secured in face-to-face relationship with at least one of the clamping flanges or discs and having apertures therein

which are adapted to be moved into and out of registry with corresponding apertures in the clamping flange or disc. Thus a simple means has been provided for readily and effectively controlling the amount of air which is to be circulated through the completed buffing assembly during operation.

For a more complete understanding of this invention reference will now be made to the drawing, wherein

Fig. 1 is a perspective view of a hub mounting constructed in accordance with one embodiment of this invention;

Fig. 2 is a sectional detail view of a buffing wheel assembly mounted on a spindle and employing the hub mounting shown in Fig. 1; and

Fig. 3 is a detail end view of the assembly shown in Fig. 2 illustrating the mode of operation of the air control means.

With particular reference to the drawing, the hub mounting of this invention comprises a pair of flanges 10 and 12 secured respectively by welding or otherwise to the opposing ends of a pair of telescopically engaged tubular members 14 and 16. The tubular member 14 and the disc 10 are coaxially arranged and have a central aperture which is substantially the same diameter as a spindle 18 of a buffing machine (not shown) on which the hub is to be mounted. Thus it will be noted that the flange 10 and the tubular member 14 are capable of being slipped onto the spindle 18 and closely embraced thereby, so that the disc 10 or the tubular member 14 will not have a tendency to wobble when the spindle is rotated at high speeds.

The tubular member 16 is arranged to slip over the outer surface of the tubular member 14 in closely fitting telescopic engagement. In order to increase the desired frictional resistance between the two telescopic members 14 and 16 there are provided a plurality (preferably three) of longitudinally extending, spaced slits 20 in the side wall of the tubular member 16. These slits 20 define longitudinally extending wall-engaging portions which may be deformed inwardly to a slight extent in order that a firm frictional purchase will be attained when the tubular member or sleeve 16 is slip-fitted over the outer surface of the tubular member 14.

In order to prevent that portion of the hub mounting comprising the member 16 and the flange 12 from wobbling when the hub is mounted on a spindle, the central, spindle-receiving aperture 22 of the flange or disc 12 has substantially the same diameter as the spindle 18. Thus when the buffing wheel including the hub mounting is assembled as indicated in Fig. 2, the shoulder 24 integral with the disc 12 and surrounding the central opening 22 closely embraces the spindle 18, thus preventing any wobbling motion during the rotation of the buffing wheel assembly. The shoulder 24 operates effectively in this manner whether the telescoping members 14 and 16 are almost completely telescoped, as indicated in Fig. 2, or are extended more fully to accommodate an increased number of buffing sections in a manner not depicted in the drawing.

Each of the discs 10 and 12 is provided with a plurality of circumferentially spaced apertures 26 which serve to permit air to be drawn to a central portion of the buffing assembly, as will hereinafter be more fully described. Each of these apertures 26 is defined in part by tongue members 28 struck out from the discs 10 and 12 and they extend inwardly toward each other into the space embraced between the two discs. The tongue members 28 are provided with outwardly facing, buffing element-supporting surfaces 30, and these surfaces, in cooperation with each other, serve to maintain the buffing element in alignment on the buffing wheel assembly.

As shown in Fig. 2, the buffing element of the assembly comprises a plurality of centerless buffing wheel sections 32, each of which is in the shape of a ring or annulus. These centerless buffing sections may be constructed in the manner disclosed in the copending application of Sax and Kingsbury, and, briefly, they each comprise a metallic ring 34 having a plurality of radially extending fingers 36 providing a circular channel 38 for receiving a spirally wound buffing fabric 40 wound in the shape of an annulus and doubled over and supported on a wire 42. The metallic supporting ring 34 of each section is also provided with a plurality of spaced interlocking tongues 44 which extend out of the plane of each ring into the plane of an adjacent ring so that when the sections are clamped together axially they will be firmly maintained in coaxial alignment. Also there are provided notches in each of the sides of the metallic rings 34 which, alone or in cooperation with the notches in an adjacent ring, define radially extending air passageways from a central portion of the hub assembly through the buffing fabric to the outer peripheral portion thereof.

From the foregoing it will be noted that the hub mounting of this invention may be readily employed for rapidly assembling a plurality of centerless buffing sections. In order to accomplish this the telescoping tubular members 14 and 16 are separated from each other and the desired number of centerless buffing sections 32 are arranged concentrically, care being taken that the total axial thickness of the resulting assembly of sections is not greater than the distance which will permit the member 14 from reaching to and within the member 16 when the assembly is clamped between the flanges 10 and 12. After the buffing sections 32 have been coaxially arranged with their interlocking tab members 44 in position as indicated in Fig. 2, then the flanges 10 and 12 and the corresponding tubular members 14 and 16 are brought into the centerless assembly from either side with the tubular member 14 being slip-fitted in telescoping relationship into the member 16 and the inner peripheral edges of the flanges 10 and 12 engaging the outer faces of the outside sections of the assembly. The member 16 by virtue of the slightly deformed wall portions between the slits 20 frictionally engages the tubular member 14, thus preventing accidental separation of the flanges 10 and 12. The flanges 10 and 12 are then pushed together more tightly so that the supporting surfaces 30 of the tongues 28 slide under and engage the inner peripheral edges of the buffing sections 32 at either end of the assembly in much the same manner as the interlocking tongues 44 of one section engage the next adjacent section.

When this operation has been completed the hub mounting is ready to be mounted on a spindle whenever desired. In order to effect this it is only necessary to remove the nut 48 from the end of the spindle 18 and pass the end of the spindle through the aperture 22, the central aperture in the tubular members 14 and 16, and the central aperture in the clamping disc 10. An abutment 50 is provided on the spindle 18 so that when the nut 48 is drawn up tight, the

flanges 10 and 12 will be firmly clamped together. It will be apparent that the circumferentially spaced tongues 28 on the clamping discs 10 and 12, together with the tongue members 44 on adjacent buffing sections, serve to hold the buffing sections firmly in alignment during rotation of the buffing wheel assembly. The nut 48 is drawn up sufficiently tightly to insure that the assembly will rotate as a unit with the spindle.

It will be apparent that when the buffing wheel assembly is operated a considerable amount of air is drawn through the apertures 26 into the central hollow portion of the buffing wheel assembly and is forcibly discharged by centrifugal action through the radially extending passageways formed by the notches 46 between the buffing sections. As has been indicated above, it quite often happens that the rate of air passed through the buffing wheels is much greater than that required for the desired cooling, and, in fact, is so great that it hampers the activities of the operator of the wheel. Accordingly, in order to adjust the amount of air passing through the wheel in accordance with this invention there have been provided one or more supplemental discs 52 having apertures 54 which may be slipped onto the spindle 18 on one or both sides of the buffing wheel assembly at the time that it is mounted on the spindle. The discs 52 are preferably of the same size and shape as the discs 10 and 12 except they may be made from a lighter gauge sheet stock. This is an advantage since the same die may be employed for making all of these discs. The apertures 54 are formed and spaced to register with the apertures 26 within the flanges 10 and 12. Also, the supplemental discs 52 are provided with central apertures through which the spindle 18 may extend so that the flanges or discs 52 may be secured in face-to-face relationship with either or both of the flanges 10 or 12 as will be apparent from Figs. 2 and 3.

In order to adjust the amount of air circulated through the buffing wheel it is only necessary to loosen the bolt 48 and then relatively rotate the disc 52 with respect to the flange 10 or 12 to throw the respective apertures into or out of complete registry, as may be desired. This is illustrated in Fig. 3 in which the apertures are shown in only half registry which would about cut in half the amount of air which would otherwise be drawn in through that half of the buffing wheel. Thus it is possible to regulate the amount of air to be circulated through the buffing element and it may be cut off substantially entirely if desired merely by closing the openings in the manner indicated. It will be noted that Fig. 2 shows the buffing wheel assembly in which the draw bolt 48 on the spindle 18 has been loosened to permit the relative movement of the air regulating discs 52. Of course, when this bolt is drawn down to operating position the discs 52 will be deformed slightly and drawn up tightly against the corresponding discs 10 and 12 so that the entire assembly rotates as a unit with the spindle.

It will thus be apparent that there has been provided a hub mounting for a buffing wheel assembly particularly useful for the preassembly of buffing sections. Such preassembly may be effected by relatively inexperienced labor at a point removed from the machine and at a time when the machine is in operation. When it becomes necessary to insert a new buffing assembly on the machine it is only necessary for the operator to stop the machine, remove the bolt 48 from the spindle, withdraw the old assembly, and slip a new assembly thereon. Thus a minimum of time is lost during this operation. Inexperienced labor can be employed for dismantling the worn sections from the hub mounting and reassembling the next sections at a convenient time at a point removed from the machine. A further feature of the invention is that the hub mounting may be expanded or contracted within limits of the telescoping tubular members to accommodate different numbers of buffing wheel sections. Furthermore, means have been provided for readily controlling the air that may circulate through the buffing wheel.

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.

I claim:

1. A hub mounting for a plurality of buffing sections comprising a first tubular member adapted to be slipped in coaxial relation over a spindle of uniform cross section, a second tubular member adjustably slip-fitted over the first member in coaxial relationship, a first clamping disc secured to one end of said first member, a second clamping disc secured to the opposite end of said second member, said discs and said members having an axial spindle-receiving aperture of the same cross-sectional size adjacent each disc to permit mounting on said spindle without wobbling during operation, and a plurality of circumferentially spaced buffing section-supporting tongues struck out toward each other from each disc, having outwardly facing circumferentially spaced support surfaces and being radially spaced from said tubular members and partially defining ventilating apertures between said support surfaces of said tongues and the center of each disc, one of said tubular members being provided with a plurality of longitudinal slits defining resilient wall member sections for frictionally engaging the other tubular member.

2. A buffing wheel assembly comprising a spindle, a first tubular member fitted around said spindle and coaxial therewith, a second tubular member telescopically slip-fitted over said first member and coaxial therewith, a first flange secured to one end of said first member having a central aperture through which said spindle extends, a second flange secured to the opposite end of said second member also having a central aperture through which said spindle extends, a plurality of circumferentially spaced buffing element-supporting tongues on each flange radially spaced from said tubular members extending toward the other flange and presenting outwardly facing buffing element supporting surfaces, a ring-shaped buffing element having an inner peripheral edge spaced from said tubular members and being supported between said flanges and, said surfaces engaging said inner edges and supporting said buffing element coaxially with said spindle, and means on said spindle for clamping said flanges together in secure element-supporting relationship, one of said tubular members being provided with at least one longitudinal slit providing a resilient wall section for frictionally engaging the other of said tubular members.

3. A buffing wheel assembly comprising a spin-

dle, a first tubular member slip-fitted over said spindle and coaxial therewith, a second tubular member telescopically slip-fitted over said first member in longitudinally adjustable coaxial relationship, a first flange secured to one end of said first member perpendicular to said spindle having a central aperture through which said spindle extends, a second flange parallel to said first flange secured to the opposite end of said second member also having a central aperture through which said spindle extends, a plurality of circumferentially spaced tongues having radially outwardly facing buffing element-supporting surfaces on each flange extending toward the other flange, a ring-shaped buffing element having radial air passageways supported between said flanges and having an inner peripheral edge engaging said surfaces in spaced relationship to said second member thus providing a hollow portion for said assembly, at least one of said flanges having aperture means in the area between the central aperture and the tongues providing an air inlet to said hollow portion, and means on said spindle for clamping said flanges together in secure element-supporting relationship.

4. A buffing wheel assembly comprising a spindle, a pair of spaced buffing element support flanges mounted on said spindle for rotation therewith, a ring-shaped buffing element mounted between said flanges having an inner peripheral edge spaced from said spindle providing a hollow portion in said assembly, means in said element defining radial air discharge passageways therethrough from said hollow portion, at least one of said flanges having apertured means providing an air intake into said hollow portion, a third flange in face-to-face relationship with said one flange having apertured means adapted to be moved into and out of registry with said first mentioned apertured means for controlling the intake of air into said hollow portion, a plurality of circumferentially spaced tongues on each flange having surfaces engaging said inner peripheral edge and cooperating to hold the buffing element in coaxial relationship with said spindle, and means on said spindle for clamping said flanges together in secure element-supporting relationship.

5. A buffing wheel assembly comprising a spindle, a pair of spaced buffing element support discs mounted on said spindle for rotation therewith, a plurality of circumferentially spaced tongue members struck out from said discs into the space therebetween leaving air intake apertures therein spaced from said spindle, a ring-shaped buffing element mounted between said discs and supported on its inner peripheral edge on the outer surfaces of said tongue members in spaced relationship to said spindle, means in said element defining radial air discharge passageways, an air intake control means including a flange secured in face-to-face relationship to at least one of said discs having apertures adapted upon relative rotation of the flange with respect to said one disc to be moved into and out of registry with said first mentioned apertures for controlling the intake of air into the central portion between said spindle and said buffing element, and means on said spindle for clamping said discs and said flange together in secure element-supporting relationship.

6. A buffing wheel assembly comprising a spindle, a pair of spaced buffing section support discs adjustably mounted in parallel relationship on the opposing ends of a pair of telescopically engaged tubular members, the inner of said tubular members embracing said spindle in close fitting relationship, a plurality of circumferentially spaced tongue members struck out from the area of each disc adjacent the periphery thereof into the space between the discs providing outwardly facing buffing section support surfaces and providing air intake apertures in each disc radially spaced from said tubular members, a plurality of ring-shaped buffing sections mounted coaxially between said discs and supported on their inner peripheral edges by said surfaces in radially spaced relationship to said tubular members providing a hollow portion within said assembly, means associated with said sections defining radial air discharge passageways therebetween from said hollow portion, a third disc secured in face-to-face relationship to at least one of said discs having apertures therein adapted upon relative rotation of the third disc with respect to said one disc to be moved into and out of registry with said first mentioned apertures for controlling the intake of air into said hollow portion, and means on said spindle for clamping said discs together in secure section-supporting relationship.

7. The buffing wheel assembly recited in claim 6 wherein the outer telescopically mounted tubular member is slit longitudinally providing resilient wall members for frictionally engaging the outer surface of the inner tubular member.

8. The buffing wheel assembly recited in claim 6 wherein the outer of said tubular members also embraces said spindle in close fitting relationship adjacent that end thereof mounting one of said discs.

9. The buffing wheel assembly recited in claim 6 having three or more ring-shaped buffing sections wherein only the sections next adjacent said discs are directly engaged by said tongue surfaces and wherein the remaining sections are maintained in alignment by a plurality of integral tabs extending out of the plane of one ring into the plane of the next ring adjacent the inner peripheral edges thereof.

10. A hub mounting for a plurality of buffing sections comprising a pair of telescopically engaged tubular members one of which is adjustably slip fitted over the other and one of which is provided with at least one longitudinal slit providing a resilient wall section for frictionally engaging the other of said tubular members, a pair of clamping plates secured to the opposing ends of said tubular members for embracing said buffing sections therebetween, and a plurality of spaced buffing section-supporting tongues on each plate extending toward the other plate.

11. A hub mounting for a plurality of buffing sections comprising a pair of telescopically engaged tubular members one of which is adjustably slip-fitted over the other and one of which is provided with at least one longitudinal slit providing a resilient wall section for frictionally engaging the other of said tubular members, a pair of clamping plates secured to the opposing ends of said tubular members for embracing said buffing sections therebetween and an annularly arranged buffing section-supporting means on each plate radially spaced from said tubular members and projecting toward the other plate.

12. The hub mounting recited in claim 11 wherein at least one of said plates is formed to provide ventilating apertures in the area between said supporting means and the thereto secured tubular member.

13. A buffing wheel assembly comprising a

spindle, a first tubular member fitted around said spindle and coaxial therewith, a second tubular member telescopically slip-fitted over said first member and coaxial therewith, a first flange secured to one end of said first member having a central aperture through which said spindle extends, a second flange secured to the opposite end of said second member also having a central aperture through which said spindle extends, an annularly arranged buffing section-supporting means on each flange radially spaced from said tubular members extending toward said other flange and presenting outwardly facing buffing element-supporting surfaces, a ring-shaped buffing element having an inner peripheral edge spaced from said tubular members and being supported between said flanges, said surfaces engaging said inner edges and supporting said buffing element coaxially with said spindle, and means on said spindle for clamping said flanges together in secure element-supporting relationship, one of said tubular members being provided with at least one longitudinal slit providing a resilient wall section for frictionally engaging the other of said tubular members.

14. The assembly recited in claim 13 wherein each flange is formed to provide ventilating apertures in the area between the supporting means and tubular member and the thereto secured tubular member.

15. A buffing wheel assembly comprising a spindle, a first tubular member slip-fitted over said spindle and coaxial therewith, a second tubular member telescopically slip-fitted over said first member in longitudinally adjustable coaxial relationship, a first flange secured to one end of said first member perpendicular to said spindle having a central aperture through which said spindle extends, a second flange parallel to said first flange secured to the opposite end of said second member also having a central aperture through which said spindle extends, an annularly arranged buffing section supporting means on each flange radially spaced from said tubular members extending toward said other flange and presenting outwardly facing buffing element supporting surfaces, a ring-shaped buffing element having radial air passageways supported between said flanges and having an inner peripheral edge engaging said surfaces in spaced relationship to said second member thus providing a hollow portion for said assembly, at least one of said flanges having aperture means in the area between the central aperture and the annularly arranged means providing an air inlet to said hollow portion, and means on said spindle for clamping said flanges together in secure element-supporting relationship.

BEN P. SAX.

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