

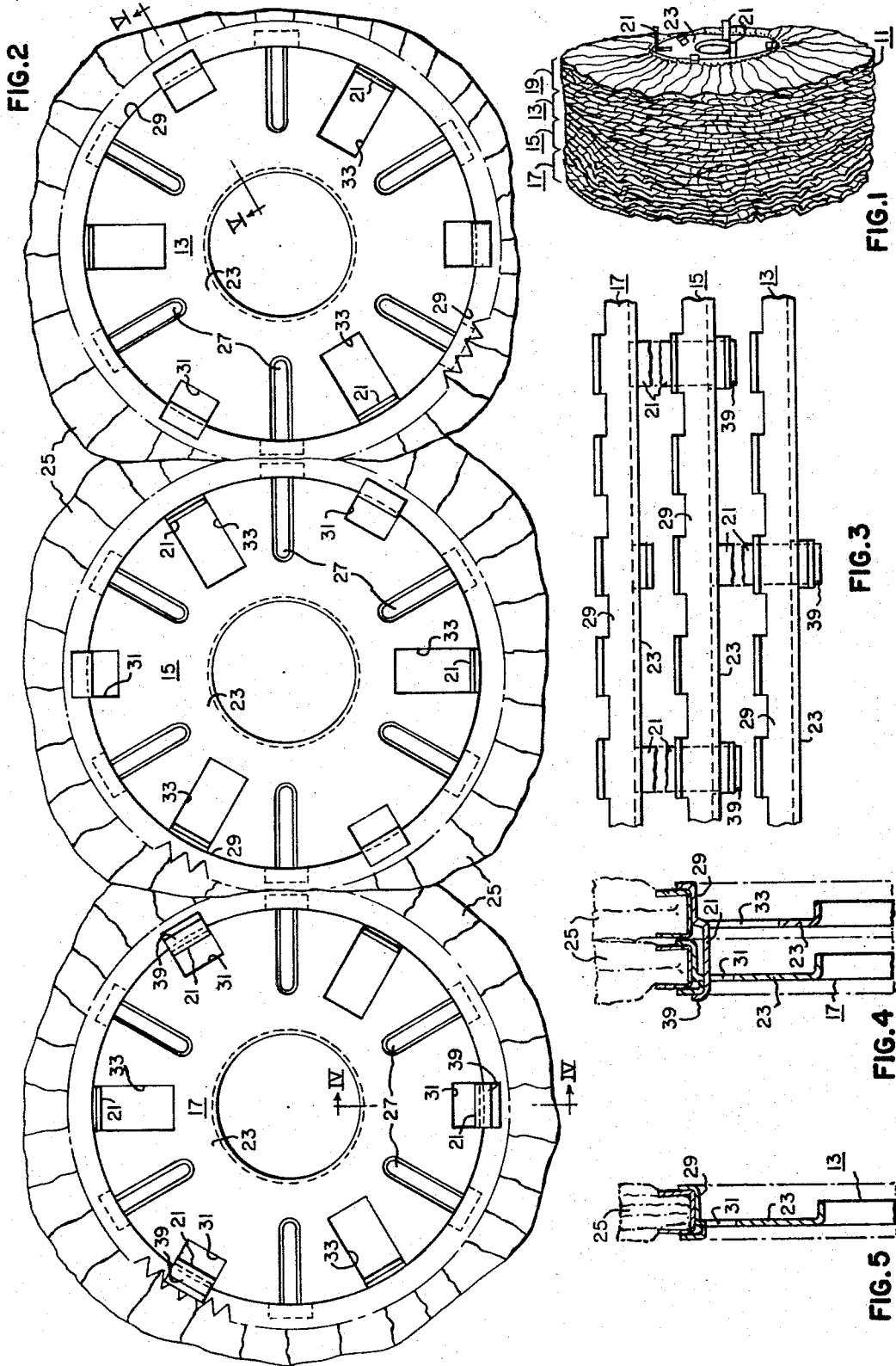
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BUFFING ASSEMBLY AND BUFFING WHEEL THEREFOR

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BUFFING ASSEMBLY AND BUFFING WHEEL THEREFOR

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ABSTRACT OF THE DISCLOSURE

A buffing wheel assembly for buffing wide surfaces in which a plurality of buffing wheels 25 are abutted to form a wide buffing surface. Each wheel has a hub 23 having openings 31 and 33. Gripping tabs 21 extend from the openings 33 and these tabs 21 of one wheel pass thru an opening of another axially-displaced wheel and are bent over to grip and hold the wheels tightly together in the assembly. The holes 33 and tabs 21 are formed by a piercing and forming process so that there is no loss of hub metal.

This invention relates to finishing apparatus and has particular relationship to buffing assemblies for buffing metallic and other objects such as the trim parts of automobiles. The words "finishing" and "buffing" are used herein in their general senses including polishing and buffing and related surface treating operations.

Apparatus which has found wide application in the finishing art is disclosed in Schaffner Patent 2,805,530. This patent discloses a finishing or buffing wheel comprising a hub from which finishing fabric extends radially in an annulus. The wheel is formed by winding plies of the fabric helically on the periphery of the hub and securing the fabric by clamping teeth, on rims extending around the periphery of the hub, into engagement with the fabric adjacent the hub. The fabric may be abrasive as disclosed by the Schaffner patent or non-abrasive; that is smooth. The fabric is pleated and is generally loose in a direction axially of the hub, the inner pleats pushing the outer plies out axially. Pressure exerted axially around the periphery of the hub reduces the thickness of the fabric annulus in the region of the hub substantially. The wheel disclosed in Schaffner patent is mounted on an arbor passing centrally through its hub and is rotated in finishing engagement with the work.

A wheel such as is disclosed in the Schaffner patent has a relatively narrow buffing surface or facing width. Typically this surface may have a width of about one-half inch to three-quarters of an inch. A demand has arisen for an annular buffing assembly which is used in the finishing art similar to that disclosed in Schaffner patent but which has a wide buffing surface, typically as wide as ten or twelve inches or greater. It is an object of this invention to provide such an assembly.

In accordance with the teaching of the prior art an assembly formed of a stack of wheels as described above has been proposed. The use of such an assembly requires that the wheels of the stack be held firmly together. This problem has not been satisfactorily solved and it is an object of this invention to provide a satisfactory and effective solution for this problem, namely to provide an assembly in which the wheels are held firmly and tightly together in the stack. It is a specific object of this invention to provide a buffing wheel particularly suitable for use in an assembly in accordance with this invention.

The buffing assembly according to this invention includes a stack of buffing wheels each having a small facing or buffing width compared to the width of the assem-

ply. In accordance with this invention the individual wheels of this assembly are interlocked with each other so that the whole assembly remains tightly compressed at the hub under load. Wheels are provided in accordance with this invention which are particularly adapted to achieve effective interlocking.

The wheel according to this invention is similar to the wheel of the Schaffner patent in that it includes a hub usually of sheet metal from which an annulus of buffing fabric extends. The hub of the wheel has a plurality of openings circumferentially spaced around the hub. Tabs extend from the hub generally parallel to the axis of, or axially to, the wheel. In the buffing assembly the tabs from the hub of each wheel in the stack extend through openings in the hub, at least of the adjacent wheel in the stack and are bent over to clamp tightly the adjacent wheel on its side opposite to the side abutting the wheel from which the tabs extend. The hub of each wheel is formed by stamping to produce the openings. For the tabs the stamping dies may be such as to leave a portion of the periphery of the stamped material uncut. The tabs may then be formed by bending the slitted strip about this uncut portion.

Specifically the wheels are clamped together in pairs with the tabs of alternate wheels displaced circumferentially with respect to the tabs of the intermediate wheels. Thus the first wheel on one side of the stack is clamped by its tabs to the second wheel on this side of the tabs. This unit of two wheels is produced by setting the second wheel on the first wheel with the tabs of the first wheel extending through the hub of the second wheel and the tabs of the second wheel displaced circumferentially with respect to the tabs of the first wheel. The two wheels are then pressed together and held tightly and the tabs of the first wheel are bent over to clamp the second wheel. The third wheel is then placed on the second wheel with the tabs of the second wheel passing through openings in its hub, and the tabs of the third wheel circumferentially displaced with respect to the tabs of the second wheel. The compression, bending and clamping operation is then repeated. Additional wheels may be added in the same way. The last wheel of the stack need not have tabs or the tabs may be bent over a dummy hub from which no fabric extends.

An advantage of the assembly, aside from its rigidity, according to the invention is that an assembly with any buffing surface width may be produced by interlocking together the requisite number of wheels. Another advantage is that if the cloth in any part of the assembly is deteriorated or damaged, it is not necessary to replace the whole assembly. The assembly is pried apart in the deteriorated region and the wheel or wheels whose cloth is damaged is unclamped and replaced by a sound wheel or wheels. Another advantage is that the fabric of the wheels in the assembly may be tightly packed particularly in the region of the hub. The first and second wheels may be pressed tightly before clamping. Thereafter it is only necessary to press each successive wheel before it is clamped to a pressed unit of the preceding wheels. A tight assembly is thus produced.

The novel features considered characteristic of this invention are disclosed above. For a better understanding of this invention, both as to its organization and as to its method of operation, together with additional objects and advantages thereof, reference is made to the following description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a view in perspective showing an embodiment of this invention;

FIG. 2 is a development in top elevation, with parts of the fabric broken away, of three of the wheels of FIG. 1;

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FIG. 3 is a development in side elevation of the part of the assembly shown in FIG. 2 with the wheels or sections separated;

FIG. 4 is a fragmental view in section taken along line IV—IV of FIG. 2; and

FIG. 5 is a fragmental view in section of a wheel used in the practice of this invention.

The apparatus shown in FIG. 1 is a buffing assembly 11 made up of a plurality of buffing wheels or sections including wheels 13, 15, 17, 19 (FIGS. 2 and 3). The embodiment of FIG. 1 is shown with the last wheel omitted and with the tabs 21 of the next-to-last wheel extending axially. In the practice of this invention an additional wheel (not shown) or dummy hub (not shown) is placed on the wheel 19 and the tabs 21 are clamped to this wheel or hub to complete the assembly.

Each wheel of the assembly 11 includes a hub 23 from which an annulus of fabric 25 extends (FIG. 5). The wheel may be formed as taught by the above-mentioned Schaffner patent. Each hub may have stiffening ribs 27 extending radially inwardly from the periphery 29.

From the periphery 29 of each hub 23, slots 31 and 33 extend radially inwardly around the circumference of each hub. The slots may be of the same length but preferably the slots 31 are shorter than the slots 33. From a region of each slot 33 adjacent the periphery 29 the tab 21 extends axially. The tab 21 may be welded to the periphery 29 at the slot 33 or, and preferably, it may constitute the metal strip of the hub slit to produce the slot and may be joined integrally to the periphery 29.

The wheels 23 in the assembly 11 are stacked with the tabs 21 of each wheel extending through the slots 31 of the adjacent wheel on one side. The wheels in the stack are interlocked in pairs by bending over and clamping tightly the tab 21 on the side of each adjacent wheel remote from the preceding wheel. In each case a bent-over clamping lip 39 engages the periphery adjacent the slot 31. The tabs 21 of alternate wheels are staggered with respect to the tabs 21 of the intermediate wheels.

The assembly as disclosed herein in which adjacent wheels are clamped has been found to produce highly satisfactory results and embodies an important aspect of this invention. This invention comprehends within its broader aspects an assembly in which the tabs from one wheel engages the periphery or rim of a wheel which is not adjacent to it. For example, the tabs from a wheel may pass through the hubs of two wheels, the adjacent wheel and one adjacent to the adjacent wheel, and engage the rim of the wheel adjacent to the adjacent wheel.

While preferred embodiments have been disclosed herein, many modifications thereof are feasible. This invention then is not to be restricted except insofar as is necessitated by the spirit of the prior art.

I claim as my invention:

1. A buffing assembly formed of a stack of buffing wheels, the buffing surface width of said assembly being

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large compared to the buffing wheel surface of any of said wheels, each said buffing wheel comprising a buffing fabric extending radially from a central hub, the hub of each of said wheels having a plurality of circumferentially spaced openings, extending between the periphery of the hub and the center of the hub of said last-named wheel, gripping tabs extending axially from at least certain of the openings of at least certain of said wheels, the tabs of each of said certain wheels in said stack passing through said opening in the hub of at least one wheel axially displaced from each said certain wheels and engaging said one wheel on the side thereof remote from the associated certain wheel.

2. The wheel of claim 1 wherein each opening and gripping tab is formed by a piercing and forming operation wherein each hub is pierced, in each region where an opening and tab is to be formed, to cut a slit in the shape of a geometric figure open in one region and the tab is formed by bending the material of the slit portion outwardly about said last-named region.

3. The wheel of claim 1 wherein gripping tabs extend only from certain of the openings of each wheel and the certain wheels from which the gripping tabs extend are angularly displaced with respect to the axially displaced wheels engaged by the gripping tabs so that the gripping tabs from said certain wheels pass thru the openings from which said tabs extend of the axially displaced wheels.

4. A buffing assembly formed of a stack of buffing wheels, the buffing surface width of said assembly being large compared to the buffing wheel surface of any of said wheels, each said buffing wheel comprising a buffing fabric extending radially from a central hub, the hub of each of said wheels having a plurality of circumferentially spaced openings with gripping tabs extending from said openings of certain of said wheels, the openings and gripping tabs of said certain wheels being formed by a piercing and forming operation wherein the hubs are pierced to produce slits in the regions where the openings and tabs are to be formed, each said slit having the shape of a geometric figure open in one region and each tab is formed by bending the slit portion outwardly about said region, the tabs of each of said certain wheels in said stack passing thru said opening in the hub of at least one wheel axially displaced from each said certain wheels and engaging said one wheel on the side thereof remote from the associated certain wheel.

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