Nov. 4, 1952 C. F. SCHLEGEL 2,616,228

BUFFING WHEEL

Filed Feb. 10, 1950 2 SHEETS—SHEET 1

FIG. 1.

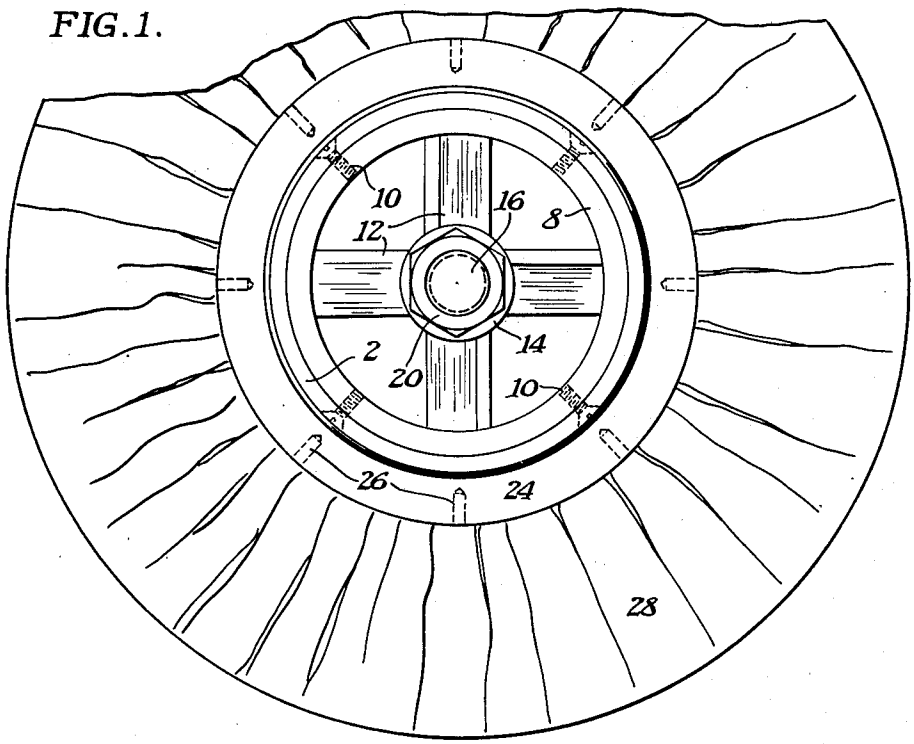



FIG. 2.

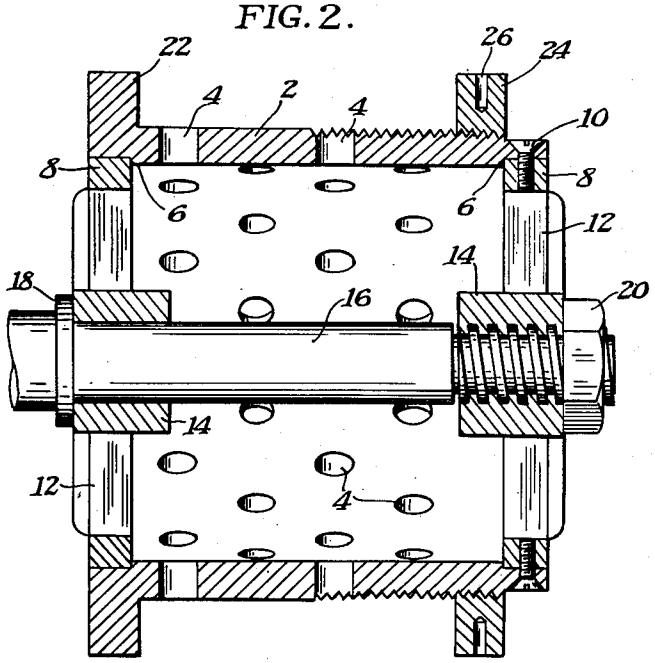
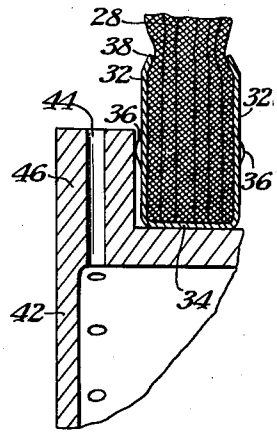



FIG. 5.




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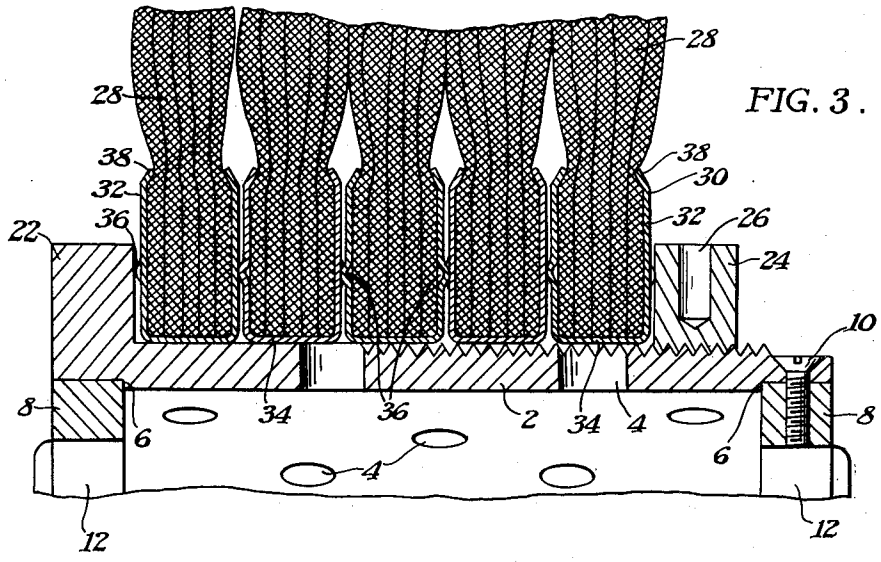
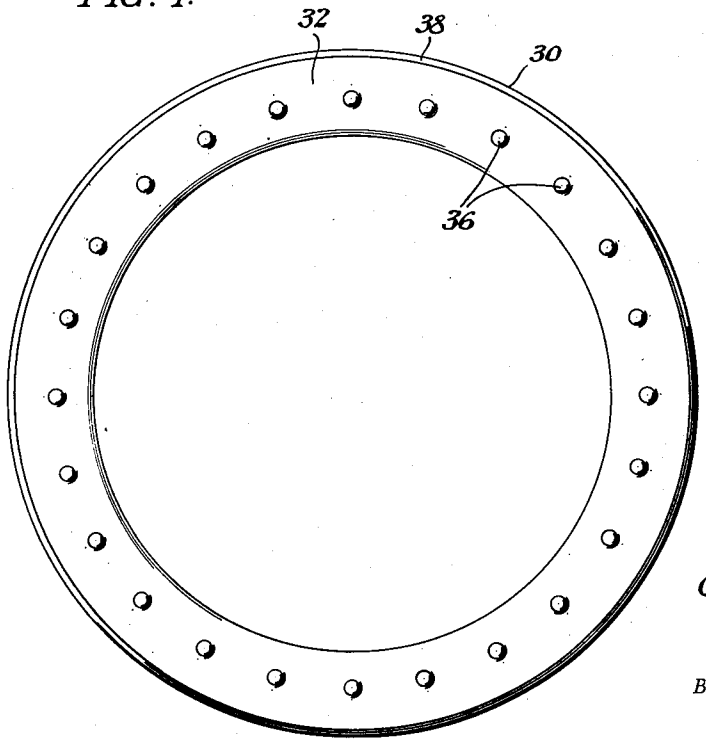



FIG. 3.

FIG. 4.




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2,616,228

## BUFFING WHEEL

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Application February 10, 1950, Serial No. 143,437

3 Claims. (Cl. 51—193)

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The present invention relates to abrading and buffing and more particularly to abrading and buffing wheels of the centrifugal air cooled type, and it has for a general object to provide a simple and efficient wheel assembly of this nature embodying improved means for inducing the flow of a large volume of air into the wheel for cooling purposes.

A further object is to induce a free flow of such air radially therefrom through a plurality of renewable annular abrading or buffing units encircling the drum of the wheel and so arranged and constructed that they afford each other mutual assistance both in maintaining air passages between them and in holding themselves tightly clamped together against any relative movement.

Another object is to provide a form of individual buffing unit functioning as above that may be simply and economically manufactured and that will be convenient to handle both in applying it to the wheel and removing it therefrom when worn.

These and other desirable objects are accomplished by the construction disclosed as an illustrative embodiment of the invention in the following description and in the accompanying drawings forming a part hereof, in which:

Fig. 1 is an end view of an air cooled buffing wheel constructed in accordance with and illustrating one embodiment of this invention; the marginal portion being partly broken away;

Fig. 2 is an axial section therethrough with the fabric units removed from its periphery;

Fig. 3 is an enlarged fragmentary similar section with the fabric units clamped in place, the outer portions of the latter being broken away;

Fig. 4 is a side view of one of the binder rings for the fabric units taken alone and on a scale between those of Fig. 2 and Fig. 3; and

Fig. 5 is a fragmentary section similar to Fig. 2 showing a modification of one of the air ducts in the wheel drum.

The same reference numerals throughout the several views indicate the same parts.

This general type of wheel is well known. The cooling is necessitated by the fact that it comprises a peripheral mass of fabric (usually cotton) either woven or knitted or otherwise suitably formed in laminations or cordage lengths, which mass is held radially taut by centrifugal action as it is rotated at high speed. As the work piece is thrust against it, frictional heat is generated that sometimes reaches a kindling temperature and charring might well otherwise result if such heat is not dissipated. An abrasive

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paste (sometimes called "grain") is applied if an abrading action is desired, or other material is used, but if simple polishing is the object the raw fabric alone is used and in the ensuing description it will be assumed that such is the case and the device will be treated as a simple buffing wheel.

Referring more particularly to the drawings, and first to Figs. 1 and 2 thereof, 2 indicates a preferably cast metal drum having a multiplicity of radial holes 4 extending therethrough to produce a foraminous central body of considerable capacity. On the interior, the ends are provided with seats 6 in which are fitted heads that include spider rings 8 secured by peripheral screws 10. The spokes 12 of the spiders are in the form of fan vanes of a pitch which, upon rotation of the drum in the proper direction, will draw air from an axial direction into the interior of the drum and tend to build up a pressure in the latter. Centrifugal force so aided by this copious replenishment, will drive this body of air radially through the openings 4 in the drum and hence through the buffing fabric as will appear.

The heads 8—12 include central hubs 14 which take the terminally threaded high speed spindle 16 with which the buffing wheel turns. The inner hub is tightened against a collar 18 on the spindle by the screw action of the outer hub, internally threaded to engage a threaded part of the spindle or arbor 16, the whole being held against accidental loosening by a lock nut 20 on the threaded end of the spindle that locks against the outer hub.

On the inner end of the periphery of the drum 2 is a fixed flange 22. The other or outer end is threaded peripherally and travelling on these threads is a clamping ring 24 provided with spanner wrench sockets 26 by which it may be turned and, in opposition to the flange 22, clamp or release the group of fabric buffer units shown in Figs. 1 and 3.

As earlier stated, the precise material of these units is open to selection according to the nature and extent of the work to be done, so whether they be of woven fabric or other suitable laminations, and whether they be stitched or otherwise bound together near their centers as is a familiar practice, or otherwise, they will be referred to as the "fabric" herein. The fairly bulky mass of each unit is indicated in the drawings at 28. The fabric of each unit is annular in form and the units are identical. Embracing the inner or central edge of each is a binder ring

or annulus 30 of relatively stiff yet, under pressure, yielding sheet material such as soft metal. The binder ring is U-shaped in cross section as appears in Fig. 3, comprising lateral flanges 32 and a connecting portion 34. The internal diameter of the ring is such as to fit over the drum 2 with the connecting portion 34 resting on the latter. A number of units are so assembled thereon, side by side, as shown. When the ring 24 is tightened down against them, they are thereby firmly clamped against each other and the flange 22, and the wheel is ready for use.

However, the binder rings are not, except at distributed points, in intimate contact with each other nor with the outer confining elements, for the outer faces of the side flanges of each binding ring are provided with a circular, preferably equally spaced arrangement of protuberances 36 intermediate their inner and outer overall diameters. These are preferably dome shaped and can be formed out from the inside of the ring. The units being identical and the binding rings identical these domes alternate with each other on adjacent units assembled on the drum and perform several functions. First, they space the binder rings definitely from each other and thus establish annular slots and air passages for the escape of the air body in the drum through the holes 4, centrifugally, to bathe and cool the fabrics 28. Second, they prevent relative rotation of any unit on the drum 2 relatively to its adjacent mate and, thirdly, the outside binder rings, through their domes 36, take contact with the drum flange 22 and the clamping ring 24 at such a high point above or, circumferentially outside of, the connecting portions 34 of all the binders that the group clamping tends to bend the flanges 32 thereof toward the fabrics 28 and pinch them more securely within the binder. In furtherance of this purpose the free edges of the flanges 32 of each unit are bent inwardly toward each other at 38.

In the modification shown in Fig. 5, the vanes or fan blades in the inner flange are omitted, and instead the inner head 42 is cast integral with the drum 2. Radial passages 44 pass through the fixed flange 46 directly into the interior of the drum, so as to insure at all times a free flow of air into the fan end of the drum and out through the holes 44 and to avoid any dead air pocket in which any body of heated air might accumulate if, in any given situation, the radial flow of air through the buff sections is less than desired.

The formation of the heads 8—12 as pieces separate from the drum 2 simplifies the molding operations when these and the drum are of cast metal. Aluminum is a convenient metal from which these parts may be cast.

It is seen from the foregoing disclosure that the above mentioned objects of the invention are admirably fulfilled. It is to be understood that the foregoing disclosure is given by way of illustrative example only, rather than by way of limitation, and that without departing from the invention, the details may be varied within the scope of the appended claims.

What is claimed is:

1. A buffing unit for buffing wheels of the centrifugal air cooled type embodying an annular body of fabric material, and a generally annular binder of sheet material embracing the central edges of the fabric, the said binder being U-shaped in cross section forming a connecting portion for contact with the drum of the wheel and lateral flanges engaging the fabric on their inner sides, the outer sides of the flanges being provided with circumferentially spaced protuberances to air space the unit from a like adjacent unit and interlock rotationally with the protuberances on the latter, said protuberances being externally convex and being spaced from each other circumferentially of the wheel by a clear distance substantially greater than the dimension of each protuberance in a direction circumferentially of the wheel, so that the protuberance of one buffing unit may enter the space between two adjacent protuberances of the next adjacent buffing unit and still leave space for radial passage of air between the two units.

2. A buffing unit in accordance with claim 1 in which the binder flanges are yieldable and the protuberances thereon are appreciably spaced radially from the connecting portion so that those on outside units of a plurality of units strung on the wheel will take contact with clamping means and tend to squeeze the contained fabric more firmly.

3. A buffing wheel of the air cooled type, including a plurality of separate annular buffing units arranged in coaxial side-by-side relation to each other, and a drum extending through the central openings of all of said units and constituting a hub for mounting and supporting said units, said drum including a substantially cylindrical hollow body of relatively thick metal having a multiplicity of air passages extending radially therethrough and having an integral abutment flange extending radially outwardly at one end of said cylindrical body and having external screw threads formed on said body at the opposite end thereof, said drum further including a nut threaded on said threads of said body and tightened to clamp said annular buffing units between said nut and said abutment flange, and further including two heads extending radially inwardly from opposite ends of said cylindrical body to engage with and support said cylindrical body from a central shaft, at least one of said heads being formed with fan-like vane spokes with air inlet openings between the spokes so that upon rapid rotation of said cylindrical body and heads said vane spokes will tend to draw air into said cylindrical body through at least one of said heads and to expel the air through said radial air passages in said cylindrical body in position to cool said buffing units, each of said buffing units including an annular body formed mainly of fabric and a sheet metal binding ring of approximately U-shaped cross section extending around the inner circumference of said annular body in embracing and binding relation thereto, the side walls of said binding ring being formed with a circumferentially spaced series of lateral protuberances with the spacing between adjacent protuberances being substantially greater than the size of each protuberance, said protuberances having their centers spaced a substantial distance radially outwardly from the inner edge of the binding ring but inwardly from the outer edges of said abutment flange and said nut so that the tightening of said nut upon a plurality of buffing units interposed between said nut and said flange will apply pressure in an axial direction to said protuberances of said binding rings of said buffing units.

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