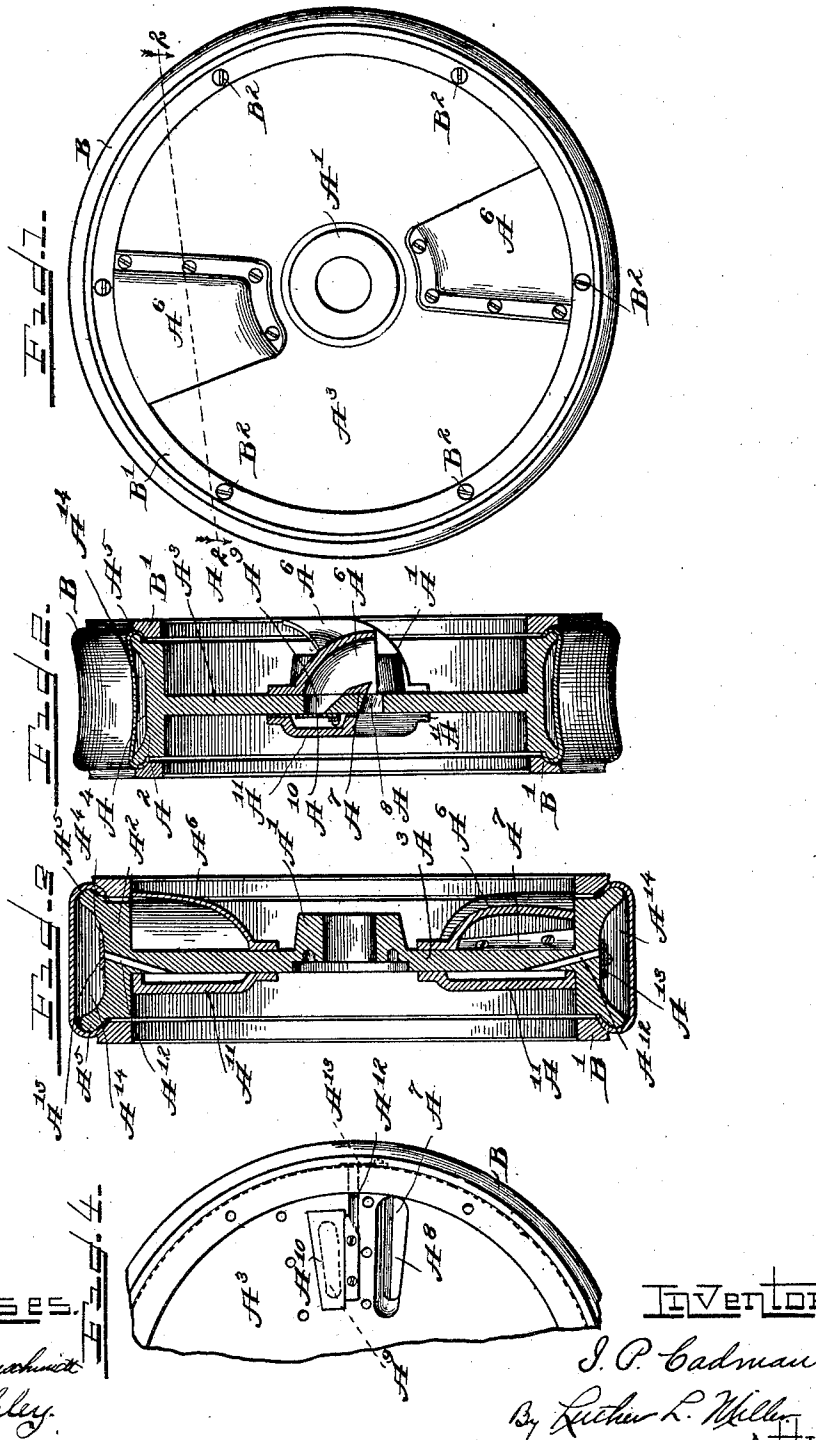
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I. P. CADMAN.

AUTOMATICALLY INFLATED POLISHING WHEEL.

(Application filed Nov. 11, 1901.)

(No Model.) 2 Sheets—Sheet 1.



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Fig. 5

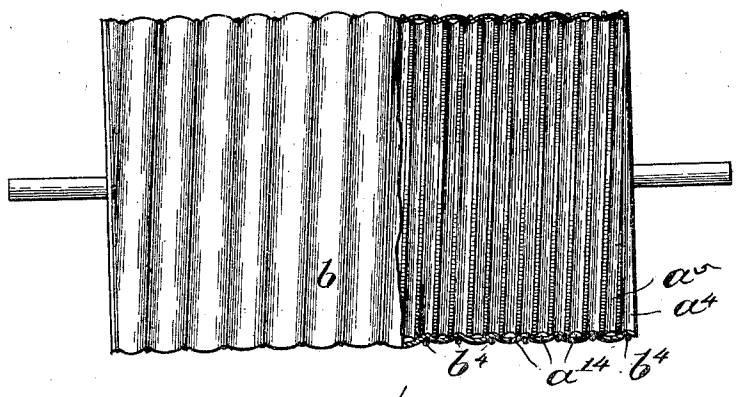


Fig. 6

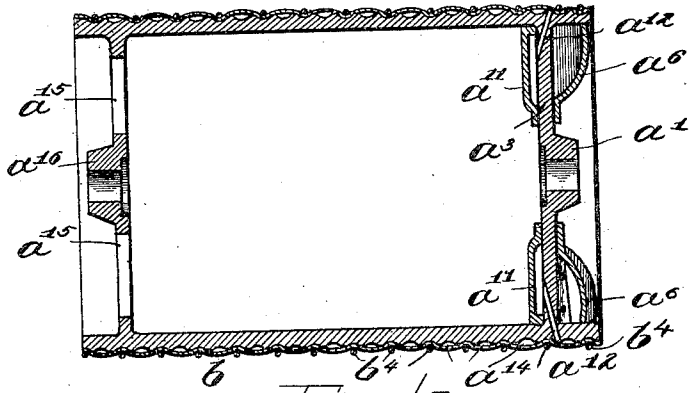
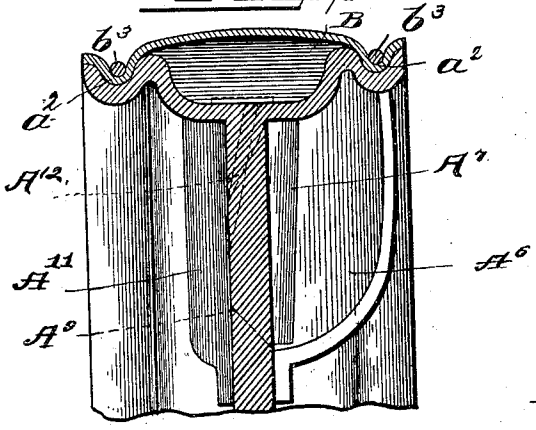


Fig. 7



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ISAAC P. CADMAN, OF BELOIT, WISCONSIN.

AUTOMATICALLY-INFLATED POLISHING-WHEEL.

SPECIFICATION forming part of Letters Patent No. 704,509, dated July 15, 1902.

Application filed November 11, 1901. Serial No. 81,875. (No model.)

To all whom it may concern:

Be it known that I, ISAAC P. CADMAN, a citizen of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Automatically-Inflated Polishing-Wheels, of which the following is a specification.

The object of this invention is the production of a pneumatic polishing-wheel the peripheral air-cushion of which is inflated by reason of the inertia of the air in which the wheel revolves.

In the accompanying drawings, Figure 1 is a side elevation of a polishing-wheel embodying the features of my invention. Fig. 2 is a transverse section on dotted line 2 2 of Fig. 1. Fig. 3 is a transverse central section through the polishing-wheel shown in Fig. 1. Fig. 4 is a fragmental side view of the polishing-wheel, the air-pocket being detached and showing the air-passage through the web of the wheel. Fig. 5 is a face view, partly in section, of a modified form of my invention, showing the application of said invention to a polishing-roll. Fig. 6 is a longitudinal central section through said roll. Fig. 7 illustrates a different form of attachment for the cover of the wheel from that shown in Figs. 1 to 4, inclusive.

Like letters of reference indicate corresponding parts throughout the several views.

In the embodiment of this invention illustrated in Figs. 1, 2, 3, and 4 I provide a polishing-wheel with a peripheral pneumatic cushion and on the sides of the wheel place air-funnels connected by suitable channels with said peripheral cushion. Inwardly-opening valves are placed in said channels to prevent the escape of air from the cushion. In the construction of this polishing-wheel I provide the wheel A, having the central hub A′, the peripheral rim A^2, the intermediate web A^3, the groove A^4 in the face of the peripheral rim A^2, and the peripheral ribs A^5 at each side of the rim. On one side of the wheel and secured to the web A^3 are two air-funnels A^6, the open sides or mouths of which open in opposite directions. Within the mouth of each of these funnels a sharp rib A^7 projects from the web A^3 of the wheel to divide the air-current entering the funnels, causing a part of said current to pass through the air-port A^8, extending through the web of the wheel, from whence it escapes on the opposite side of said web. The other part of said air-current passes from the funnel into the air-port A^9, and, opening the flat valve A^{10}, enters the pocket A^{11}, formed on the opposite side of the web A^3. From this pocket the air is forced through the air-duct A^{12}, and, passing the air-valve A^{13}, enters the air-chamber A^{14}, formed upon the periphery of said wheel. A cover B, of leather, oiled canvas, or other substance reasonably tight in its texture, in ring form is adapted to be slipped over the peripheral ribs A^5 of the wheel A and its edges held against the outer sides of said ribs by the annular rings B′, secured to the periphery of the wheel A by means of screws B^2 or in any other suitable manner. In Fig. 7 the covering B is illustrated as being held in position by spring-rings b^3, fitting into annular grooves a^2, formed integral with the peripheral rim of the wheel. This is merely a different and perhaps simpler means for holding the cover in position, although possibly not as secure as that illustrated in Figs. 1 to 4, inclusive.

Figs. 5 and 6 illustrate the application of my invention to a polishing-drum. The peripheral groove A^4 of the wheel is present in the roll or drum in helical form and in duplicate in the grooves a^4 and a^5, the former of said grooves being employed as a seat for the fastening wire or band b^4, which holds the cover b in position upon the periphery of the drum, and the other groove a^5, running parallel with the first-mentioned groove, constitutes the lower wall of the peripheral helical air-chamber a^{14}. The drum shown in Figs. 5 and 6 is provided at one of its ends with the hub a', the web a^3, the funnels a^6, the air-pockets a^{11}, air-ports, air-ducts, and air-valves in substantially the same manner as is the wheel A. (Shown in Figs. 1 to 4, inclusive.) The opposite end of the drum, however, is supported by a spider a^{15}, having supporting-spokes passing from the hub a^{16} to the rim.

In use the polishing-wheel of my invention is mounted upon a mandrel capable of rapid rotation, with the mouths of the funnels A^6 opening in the direction of the rotation of the wheel. The cover B is secured in position,

and in practice a polishing-band of fabric coated upon its outer face with abrasive material is slipped over said cover. This band (not shown) constitutes the abrasive surface of the wheel. The rapid rotation of the polishing-wheel causes the funnels A^6 to gather air, a portion of which passes directly through the ports A^8 and escapes at the opposite side of the wheel. The other part of the current in each funnel, which is divided by the rib A^7, is directed through the air-port A^9 into the air-pocket A^{11} on the opposite side of the web of the wheel. From these pockets the air is forced by the pressure of air in the funnels through the air-ducts A^{12} into the peripheral air-space A^{14}, passing and opening the valves A^{13}. The polishing-drum illustrated in Figs. 5 and 6 is adapted to polish large flat surfaces.

The modified fastening for the cover B (illustrated in Fig. 7) is intended to be used where it is desirable to detach said cover from the rim with greater facility than is afforded by the fastening illustrated in Fig. 1.

I claim as my invention—

1. A pneumatic polishing-wheel having an air-cushioned polishing-surface, a funnel for catching air as the wheel is rotated, an opening communicating between said funnel and the air-cushion, and an air-valve in said opening.

2. A pneumatic polishing-wheel having an air-cushioned peripheral polishing-surface, a funnel on the body of said wheel for catching air as the wheel is rotated, and an opening communicating between said funnel and the air-cushion.

3. A pneumatic polishing-wheel having an air-cushioned peripheral polishing-surface, a funnel for catching air as the wheel is rotated, an opening in the wheel for permitting a portion of the air caught by the funnel to escape, and an opening communicating between said funnel and said air-cushion.

4. A pneumatic polishing-wheel having an air-cushioned peripheral polishing-surface, a funnel on the side of the wheel for catching air as the wheel is rotated, a rib near the mouth of said funnel, an opening through the wheel near said rib, an opening communicating between said funnel and the air-cushion, and an air-valve in said last-mentioned opening.

5. A pneumatic polishing-wheel having an air-cushioned peripheral polishing-surface, a funnel on the side of the wheel for catching air as the wheel is rotated, a rib near the mouth of said funnel, an opening through the wheel near said rib, an air-pocket in said wheel, an air-port between the funnel and the air-pocket, an air-duct communicating between said pocket and the air-cushion, and an air-valve for said air-duct.

6. A pneumatic polishing-wheel having an air-cushioned peripheral polishing-surface, a funnel on the side of the wheel for catching air as the wheel is rotated, a rib near the mouth of said funnel, an opening through the wheel near said rib, an air-pocket in said wheel, an air-port communicating between the funnel and the air-pocket, a valve for said air-port in said air-pocket, an air-duct communicating between the air-pocket and the air-cushion, and an air-valve in said air-duct.

7. A pneumatic polishing-wheel having a hub, a rim and a web, said web having a circumferential groove, a cover for said groove, adapted to form an air-cushion, means for securing said cover in position, a funnel on the web of the wheel for catching air as the wheel is rotated, a rib near the mouth of said funnel, for dividing the current of air, an opening through the web of the wheel near said rib, an air-pocket on the web of the wheel substantially opposite the funnel, an air-port communicating between the funnel and the air-pocket, an air-valve in said pocket for said port, an air-duct communicating between said pocket and the groove in the periphery of said wheel, and an air-valve for said air-duct in said groove.

8. In a pneumatic polishing-wheel, in combination, a wheel having a peripheral rim; a peripheral rib at each side of said rim; a cover adapted to be secured over said ribs, to form an air-space between said cover and said rim; a funnel for catching air as the wheel is rotated; and an air-duct communicating between said funnel and said air-space.

9. In a pneumatic polishing-wheel, in combination, a wheel having a peripheral rim; a peripheral rib at each side of said rim; a cover adapted to be secured over said ribs, to form an air-space between said cover and said rim; a funnel on the body of said wheel, for catching air as the wheel is rotated; an air-duct communicating between said funnel and said air-space; and an air-valve for said air-duct.

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