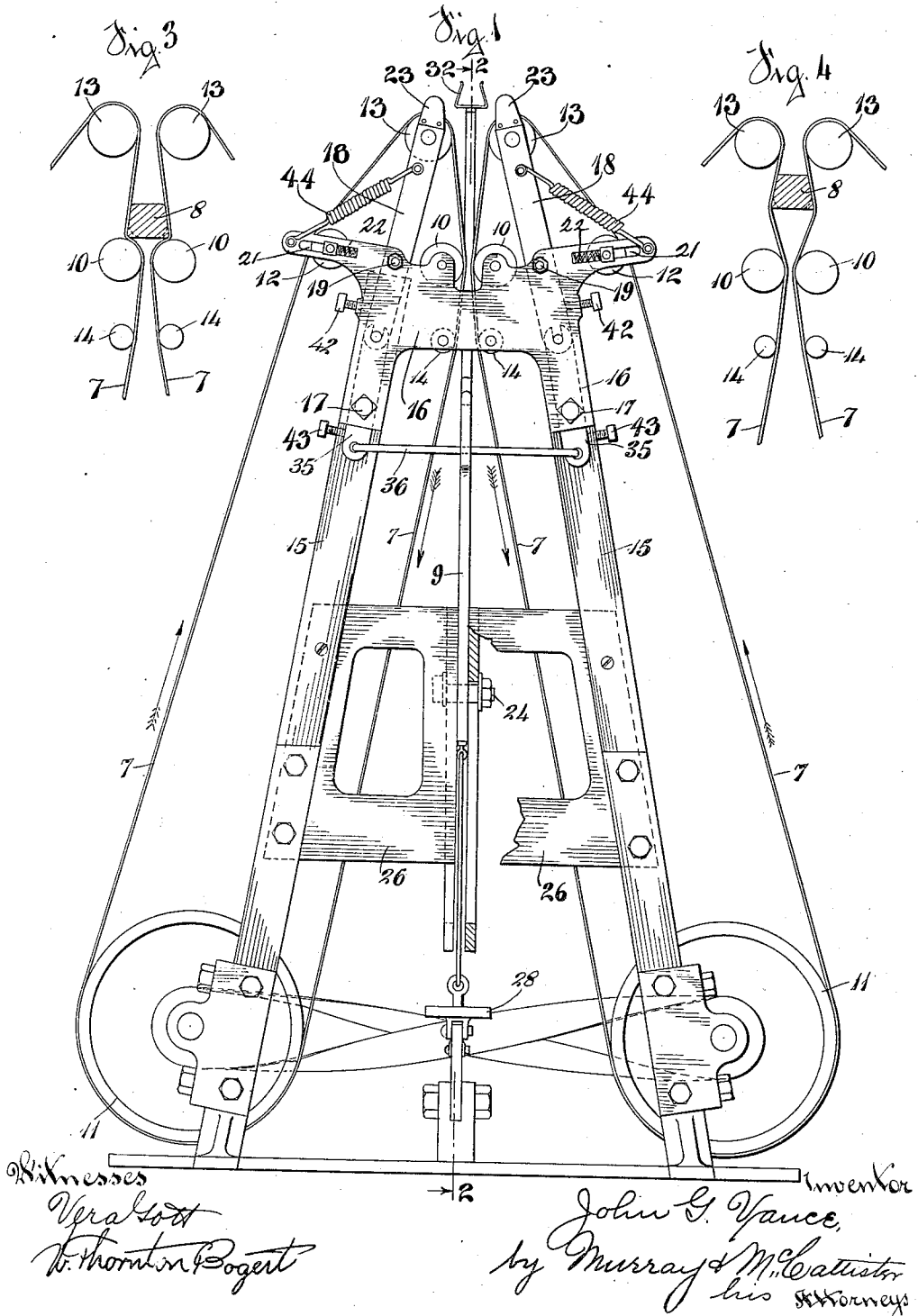


J. G. VANCE.
RIM FINISHING MACHINE.
APPLICATION FILED APR. 19, 1912.

1,057,785.

Patented Apr. 1, 1913.

2 SHEETS—SHEET 1.

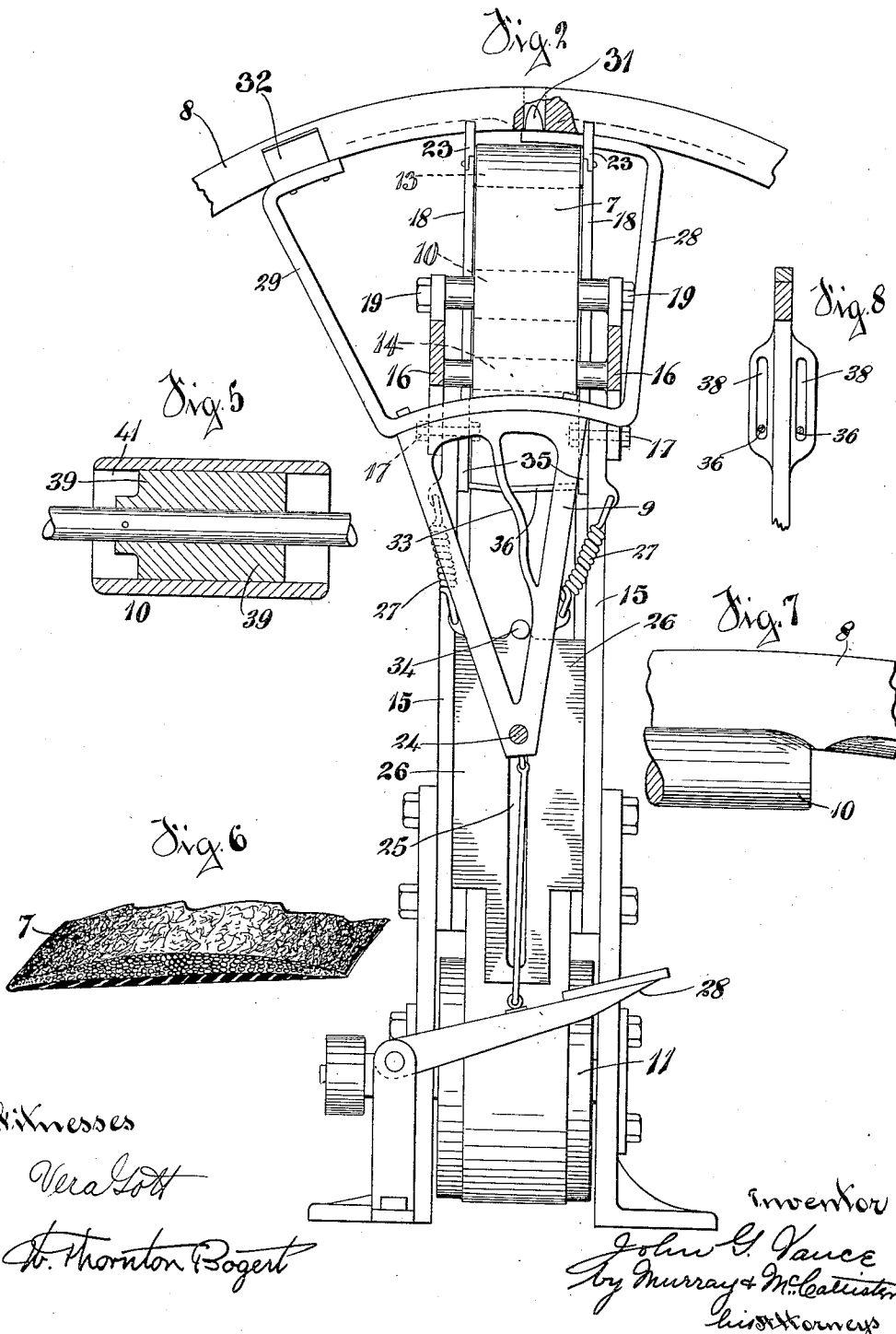


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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN G. VANCE, OF FRANKLIN, OHIO, ASSIGNOR OF THIRTY-SEVEN AND ONE-HALF ONE-HUNDREDTHS TO JACOB J. WEISNER AND TWENTY-FIVE ONE-HUNDREDTHS TO PERRY H. RUE, BOTH OF FRANKLIN, OHIO.

RIM-FINISHING MACHINE.

1,057,785.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed April 19, 1912. Serial No. 691,918.

To all whom it may concern:

Be it known that I, JOHN G. VANCE, a citizen of the United States of America, and resident of Franklin, county of Warren, and State of Ohio, have invented certain new and useful Improvements in Rim-Finishing Machines, of which the following is a specification.

This invention relates to apparatus for polishing and finishing wheel rims and has for an object to produce a machine which is capable of polishing and also of finishing wheel rims and which will automatically prevent the rim from being damaged or marred during the polishing and finishing operation.

The operation of completing a wheel rim is usually performed in three distinct operations, which are usually termed rounding, polishing and finishing. The rounding operation is usually performed by a rounding machine, which in effect bevels portions of the inner peripheral edges of the wheel rim in such a way that the spoke supporting shoulders are formed on the inner peripheral face of the rim. This operation leaves the inner and lateral surfaces of the rim in a relatively rough condition and with comparatively sharp edges or ridges on them. The polishing operation is employed for the purpose of smoothing down the roughness and rounding off the sharp edges or ridges, produced by rounding machine, and is usually performed by means of a sand belt, against which the rim is held so as to polish and smooth the portions of the inner and lateral surfaces of the rim which are located between the spoke supporting shoulders. The rim to be polished is held in the hands of the operator and is swung back and forth while it is pressed against the polishing belt. Great care must be taken during this operation to prevent the edge of the polishing belt from moving too far up onto any one of the spoke supporting shoulders since if this occurs, its edge will cut too deeply into the surface of the shoulder and will leave a ridge which will mar the rim and make it unfit for use. The polishing operation is sometimes performed in two steps, a coarse sand belt being employed in the first and a finer

belt being employed in the second step. The finishing or final operation of completing a wheel rim is performed after the wheel is assembled or after the rim is secured to the spokes and hub. It is usually accomplished by means of finishing files and sand-paper and consists in smoothing or finishing the surfaces of the spoke supporting shoulders. This operation is tedious and under some circumstances is more expensive than any of the other rim completing operations.

One object of my present invention is to produce a machine which is capable of performing the finishing operation at a reduced cost and without the liability of marring or damaging the rim.

A further object is to produce a machine for polishing and finishing wheel rims which is so constructed that it may be operated by a person, possessing little skill, without danger of damaging the wheel rim.

These and other objects I attain by means of a rim finishing machine embodying the features herein described and illustrated in the drawings accompanying and forming a part of this application.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a sectional view taken on the line 2—2 of the machine illustrated in Fig. 1, and is shown in connection with a portion of a wheel rim which is mounted on a rim support, forming a part of the machine. Fig. 3 is a diagrammatic view and illustrates the position of the rim with relation to the polishing belts, backing rollers and guide pulleys, during the polishing operation. Fig. 4 is a view similar to Fig. 3 and illustrates the positions of the belts and of the guide pulleys and rollers during the operation of moving the rim downwardly between the belts. Fig. 5 is a sectional view of a backing roller which forms a detail of my invention. Fig. 6 is a fragmental perspective view of a polishing belt which forms a detail of my invention. Fig. 7 is a fragmental view of the roller illustrated in Fig. 5, in connection with a rim, and illustrates the relative positions of the rim and roller during the polishing operation. Fig. 8 is a fragmental view of a portion of the rim

support which forms a detail of my invention.

The machine illustrated as an embodiment of my present invention includes two polishing belts 7—7, between which a rim 8, to be finished, is introduced during the finishing operation. The machine also includes a rim support or guide 9, for guiding the rim during its motion between the belts, and backing rollers 10—10, which cooperate with guide pulleys, included in the machine, in holding the belts 7—7 in polishing engagement with the rim to be finished.

Each belt is driven by a separate pulley 11, which is suitably mounted on the frame of the machine, and the belt extends over guide pulleys 12, 13 and 14 and across the face of one of the backing rollers 10. The backing rollers and all of the pulleys are mounted on the frame of the machine. In the drawings I have shown the frame of the machine as consisting essentially of inclined standards 15—15, which are secured together at their upper ends by means of two suitably shaped plates 16, each of which is clamped onto one side of each of the standards by any suitable means, such for example as bolts 17 which extend through the plates and through the flanges of the standards. The guide pulleys 12—12, 14—14, and the backing rollers 10—10 are mounted on pins or shafts which extend between the plates 16 and are mounted on the plates.

Each pulley 13 is mounted between the upper ends of a pair of arms 18, which are pivotally mounted on pins or bolts 19, mounted on the plates 16 and which are capable of moving about their pivotal points so as to move the pulley 13, carried by them, toward and away from the other pulley 13, and in this manner to vary the positions of the belts 7—7, with reference to the rim 8 to be polished. This motion of the arms 18 may be, and preferably is controlled by the rim support or guide 9 and the means employed for moving the arms will hereinafter be described.

The pulleys 12—12 are adapted to maintain the tension of the belts 7—7 substantially constant, as the arms 18 are moved to different positions, and they are also adapted to take up the stretch or the lengthening of the belts which occurs as the belts are used. This is accomplished by mounting each pulley 12 on the pin or shaft which is mounted in and is adapted to move along slots 21 formed in the plates 16. The mounting pins or shafts of the pulleys 12—12 are moved outwardly along the slots by means of springs 22 so that the pulleys 12 are forced outwardly against the belts. The pulleys 12—12 and 14—14 may be flanged, if desired, for the purpose of more positively guiding the belts 7—7, but the

pulleys 13—13 are preferably unflanged, and removable guide tips 23 are mounted on the upper ends of the arms at each side of each pulley 13 so that they guide the belts 7—7 in their passage over the pulleys 13—13 and across the face of the rollers 10—10. Such a construction has been found to be an improvement over ordinary flanged pulleys usually employed for such purposes, since it forms a more positive guide for the belts and also because the tips 23 can be removed and replaced without great expense when they have become worn. It will be understood that the arrangement and location of the pulleys may be varied and that the pulleys 14—14 may be dispensed with, if desired.

The rim support 9 is adapted to support the rim 8, to be finished, and to guide it in its motion downwardly between the belts 7—7. This motion of the rim is preferably a combination of a downward and circumferential motion and consequently the support is so mounted that it is capable of moving downwardly and at the same time swinging about a pivotal point during its downward motion. This is accomplished in the machine illustrated by providing a pivotal pin 24 at the lower end of the support 9 and by mounting the pin in vertically extending slots 25 which, as shown, are formed in guide plates 26, mounted on the standards 15. Each guide plate is provided with outwardly extending flanges, which are employed for securing it to the frame of the machine, and the slots 25 are oppositely disposed with relation to each other. The support 9 as illustrated, is provided with springs 27 for holding it in the upper or raised position in which its pin 24 engages the upper end of the slots 25. It is also provided with a foot lever 28 which projects to a convenient position in front of the machine and is capable of moving the support downwardly so that its pin 24 moves downwardly through the slots 25 and so that the rim 8, mounted on it, is moved downwardly between the belts 7, as illustrated in Figs. 4 and 3. The support consists of a triangular member on the lower end or apex of which the pin 24 is mounted, and on the upper edge of which rim supporting arms 28 and 29 are mounted. As illustrated the arms 28 and 29 are formed integrally with each other and are spread apart so that their upper ends are located about the same distance apart as the spoke holes in standard wheel rims. This, however, is not essential since the arms 28 and 29 may extend at any desired angle to each other. The upper end of the arm 28 is shown turned inwardly with reference to the arm 29 and is provided with an upwardly extending cone shaped tip 31 which is adapted to project into and en-

gage a spoke hole in the rim to be polished, and may be removably mounted on the arm 28, if desired. The arm 29 is turned inwardly with reference to the arm 28 and is provided at its upper end with a spring clamp 32 which is substantially U-shaped and is adapted to engage and grip a rim 8 when it is located on the support.

The support 9 is preferably so guided during its downward motion that it causes the rim to move between the belts 7—7 so that the spoke supporting shoulder, surrounding the spoke hole engaged by the tip 31, sweeps laterally, relatively to the belts, from a position substantially between their central portions, at the upper end of its travel, to a position such that it is engaged by the edges of the belts only, when it has reached the lower end of its travel. In addition to this, the motion of the pulleys 13 is so timed, with relation to the motion of the support 9, that the belts are forced against the surface of the rim with a gradually increasing pressure as the rim moves downwardly, and they are finally moved into engagement with the lateral faces of the rim, as shown in Fig. 3. In addition to this the backing pulleys 10—10 are so constructed that they yield in response to belt pressure and permit the edges of the belts 7—7 to occupy different positions corresponding to the contour of the surface to be polished. With this arrangement the spoke supporting shoulders on the rim can be finished by the machine without the danger of marring the rim by cutting too deeply into their surfaces.

The motion of the support 9 is controlled by means of a cam surface 33, which is formed on the support 9, and a stationary pin 34 which is mounted on the guide plates 26 which form a portion of the frame of the machine. The pin 34 is so located that it engages the cam surface 33 and coöperates with it to turn the support about its pivot pin 24, as the support moves downwardly through the slot 25. The cam surface is formed on the triangular portion of the support, but it will be understood that it may be mounted in any suitable position and that the position of the coöperating pin 34 may be changed accordingly. With the arrangement illustrated, the pin 34 not only shifts the support laterally as it moves downwardly, but it also limits the downward motion of the support by engaging the upper edge of its triangular portion. The contour of the cam surface may be varied so as to vary the motion of the support, and, if desired, it may be replaced by stops for limiting the downward and lateral motion of the support, relatively to the backing rollers 10—10, and belts 7—7.

The arms 18, on which the pulleys 13 are mounted, project downwardly below their

mounting pins or bolts 19 and engage levers 35, which are so arranged that they move the upper ends of the levers 18 inwardly, when their lower ends are moved inwardly. This is accomplished by providing a slot and pin connection between their upper ends and the lower ends of the arms 18. Means are employed for moving the lower ends of the levers 35 inwardly as the support is lowered. As illustrated, the means employed consists of a flexible connection such for example as cords 36 which extend between the lower ends of the levers 35 and engage slots 38 formed on the triangular portion of the support 9, as illustrated in Fig. 8. With this arrangement the pulleys 13 are moved inwardly toward each other, when the support is moved downwardly, but they are not affected by a lateral motion of the support.

Each pulley 10, as illustrated, includes a hub portion 39, which is rigidly mounted on the mounting pin of the pulley and which is formed of some rigid material, such for example as metal. The pulley also includes a cover or flange 41 which is formed of some resilient or yielding material, such as rubber, and is cylindrical in form with its edges over-hanging the ends of the hub portion 39. The cover 41 is substantially the same width as the belt 7, so that its edges support the edges of one of the belts 7. With this arrangement the over-hanging edges of the cover yield in response to the belt pressure and permit the edges of the belt, supported by them, to yield so as to conform in contour to the varying contours of the surface of the cover, and particularly to the contour of the spoke supporting shoulders. The resiliency of the cover is, however, such that the edges of the belt are held in engagement with the surface of the rim with sufficient pressure to finish and polish the surface of the rim with which they contact.

The pin 34 and the upper edge of the triangular portion of the support 9 are so arranged that they prevent the rim 8, carried by the support, from being moved too far down with relation to the backing rollers 10—10, and from being damaged by being subjected to too great a pressure by the polishing belts. The yielding of the edges of the belts 7—7 is accentuated by the construction of each of the belts, and the tendency for the belt to damage the rim is also diminished. As illustrated in Fig. 6, the belt is formed so that it is coarser, or has a greater cutting efficiency along its central portion than along its edges. There is no distinct line between the coarse and fine cutting surfaces on the belt, the belt being so formed that it is gradually graded off toward its edges. This construction produces a belt which is stiffer along its central portion than at its edges and is better adapted to be employed with my machine.

The operation of the apparatus is briefly as follows: A rim 8, to be polished is mounted on the guide 28 by moving it downwardly between the projecting fingers of the spring clamp 32 and by inserting the tip 31 into one of its spoke holes. The rim is then grasped in the hands of the operator and moved rearwardly, or away from the operator as far as the pin 34 will permit the guide to be moved. This brings the tip 31 and consequently the spoke supporting shoulder, supported by the arm 28, to a position above and approximately midway between the central portions of the belts 7—7, as illustrated in Fig. 2. The rim 8 is then moved downwardly, either by a pressure exerted on the rim 8 or by the coöperation of pressure exerted on the rim and pressure exerted on the foot lever 28. As the rim moves downwardly between the belts 7—7, it is forced forwardly, or toward the operator, by the coöperation of the cam 33 and the pin 34, so that the spoke supporting shoulder, supported by the arm 28, is moved laterally, with relation to the belts, to a position substantially as illustrated in Fig. 7. It will be understood that the support may be held in the rear position by a spring so that the cam surface 33 will be continually held in engagement with the pin 34. This, however, may be accomplished by varying the arrangement of the springs 27 so that one of them holds the cam surface against the pin 34. After the rim 8 has been moved to the lowest position, as illustrated in Fig. 3, the foot lever 28 is raised, and the springs 27 then operate to move the support 9 upwardly, so that the rim moves upwardly between the belts 7—7 and is finally moved out of engagement with them. The rim may be pressed rearwardly during this upward motion so that the cam surface 33, will be held in engagement with the pin 34, or it may be held in the forward position, so that it will move upwardly without causing the spoke supporting shoulder, supported by the arm 28, to engage the belts 7—7. If the former method is employed, the shoulder will sweep upwardly between the belts 7—7 through the same path it traveled during its downward motion, and the shoulder will be subjected a second time to the polishing action of the belts. After the rim has reached the upper position it is then moved along the support 9 so that the tip 31 projects into the next adjacent spoke hole. This operation is repeated for each spoke supporting shoulder, on the rim, and the rim is then turned around and placed on the support 9 in the reverse position and the operation is repeated for the purpose of polishing the opposite faces of each of the spoke supporting shoulders.

It will be understood that the cam surface

33 may be so arranged with relation to the downward throw of the guide that the entire portions of the lateral surfaces and rounded edges, located between adjacent spoke holes, will be polished during each downward motion of the support 9. It will also be understood that the support illustrated may be swung about its pivot pin 24, when it is in the lowest position, for the purpose of polishing the intermediate portions of the rim, located between adjacent spoke supporting shoulders.

The clamp 32, when it is located in the position illustrated in Fig. 2, with reference to the spoke supporting shoulders on the rim, will protect the shoulder, supported by the arm 29, from the cutting action of the edges of the belts, when the support 9, is swung about its pivot pin, in the manner just described. Stops, however, may be provided for limiting the forward swing of the support and for protecting the shoulder, supported by the arm 29.

I preferably drive the belts 7—7 in opposite direction, as indicated by the arrows in Fig. 2; that is, they are driven so that the inner sweeps of the belts move in the same directions, with relation to the wheel rim. With this arrangement the downward pull of the two polishing belts aids in moving the wheel rim to the proper position between the belts, relatively to the backing rollers 10. It will be understood that this is merely the preferred arrangement and is not absolutely essential since the machine will operate effectively when the belts are driven in the same direction. I also find it convenient to employ adjustable stops 42 and 43 for limiting the throw of the arms 18. Each stop 42 engages the lower end of one of the arms 18 and limits the inner motion of the roller, while each stop 43 engages the lower end of one of the levers 35 and therefore limits the outward motion of each roller. I have also provided coiled springs 44 for holding the pulleys 13 in their outermost positions. These springs are mounted between the upper ends of the arms 18 and projecting lugs, formed on the plates 16, and operate to hold the pulleys 13—13 outwardly and to hold the lower ends of the arms of the levers 35 against the stops 43. It will be understood, however, that the stops 43 may be dispensed with, if desired, and that the flexible connections 36 between the lower ends of the levers 35 may be employed for limiting the inner motion of the pulleys 13—13.

In accordance with the United States patent statutes, I have illustrated what I now consider to be a preferred embodiment of my invention, and I have described its details of construction together with its principles of operation, but I desire it to be understood that various changes, modifica-

tions and substitutions, may be made in the construction, details and arrangements of parts of the machine illustrated, without departing from the spirit and scope of my invention as set forth in the appended claims.

What I claim is:

1. In a machine of the character described, polishing agents for engaging opposite sides of a rim to be polished, means for yieldingly holding said agents into engagement with the rim to be polished and means for limiting the relative lateral motion between said agents and the rim.
2. In a machine of the character described, a pair of polishing belts, between which the rim to be polished is adapted to be moved, a movable support for moving the rim between the belts and guiding the lateral motion of the rim across the belts, during the polishing operation, backing rollers for holding the belts in engagement with the rim and stops for limiting the lateral motion of the rim relatively to said rollers.
3. In a machine of the character described, a polishing belt, a backing roller having a stationary bearing for holding the belt in engagement with the rim to be polished and means for limiting the motion of the rim relatively to the belt.
4. In a machine of the character described, a pair of polishing belts between which a rim to be polished is adapted to be moved, a backing roller for each belt, having a stationary bearing, a support for moving a rim between the belts and for guiding the rim in a substantially arc-shaped path during the polishing operation, and means for limiting the lateral motion of the rim relatively to the belt.
5. In a machine of the character described, a pair of oppositely disposed polishing belts, between which a rim to be polished is adapted to be moved, yielding backing rollers, having stationary bearings, for each belt, and means for guiding a rim in a substantially arc-shaped path between the belts and for limiting the lateral motion of the rim relatively to said rollers.
6. In a machine of the character described, a pair of polishing belts, between which a rim to be polished is adapted to be moved, a backing roller for each belt provided with a yielding lateral edge, a movable guide pulley for the belt and means for actuating said pulley during the polishing operation.
7. In a machine of the character described, a pair of polishing belts, a backing roller for each belt, provided with a yielding lateral edge, a movable guide pulley for the belts, means for actuating said pulley during the polishing operation, and stops for limiting the relative motion between the rim and the belts.

8. In a machine of the character described, a polishing belt, a backing roller therefor provided with an overhanging and yielding lateral edge, a movable guide pulley for the belt and means for actuating the pulley during the polishing operation to move the belt into engagement with the rim.

9. In a machine of the character described, a polishing belt, a backing roller for the belt, provided with a yielding lateral edge, a movable guide pulley for the belt, means for actuating the pulley during the polishing operation to press the belt into engagement with the rim, and an adjustable stop for limiting the motion of the pulley.

10. In a machine of the character described, a pair of polishing belts between which the rim to be polished is adapted to be moved, and means for yieldingly holding the edges of each belt into polishing engagement with the rim.

11. In a machine of the character described, a pair of polishing belts, between which the rim to be polished is adapted to be moved during the polishing operation, means for yieldingly holding the edges of the belts in polishing engagement with the rim to be polished, and stops for limiting the lateral motion of the rim relatively to the belts, during the polishing operation.

12. In a machine for finishing wheel rims, a pair of moving polishing belts between which the rim to be polished is adapted to be moved during the polishing operation, means for yieldingly holding an edge of each belt in polishing engagement with a spoke supporting shoulder of the rim, and means for guiding the movement of the rim between the belts.

13. In a machine of the character described, a pair of polishing belts, between which the rim to be polished is adapted to be moved, means for yieldingly holding an edge of each belt in engagement with the rim to be polished, means for guiding the motion of the rim during the polishing operation and stops for limiting the motion of said means relatively to the edges of the belts.

14. In a machine of the character described, a pair of polishing belts between which the rim to be polished is adapted to be moved, means for yieldingly holding an edge of each belt in polishing engagement with a rim to be polished and stops for limiting the motion of the rim relatively to the belt.

15. In a machine for finishing wheel rims, a pair of moving polishing belts, between which a rim is adapted to be moved during the polishing operation, means for yieldingly holding an edge of each belt into polishing engagement with a spoke supporting shoulder on the rim, a support for the rim during the polishing operation and means

for limiting the motion of the support relatively to the belts.

16. In a machine of the character described, two polishing belts, between which a rim is adapted to be moved during the polishing operation, a yielding backing roller for each belt, a guide for guiding the motion of the rim relatively to the belts and the backing rollers, and means for varying the relative positions of the belts to press them into polishing engagement with the rim during the polishing operation.

17. In a machine of the character described, two polishing belts between which a rim to be polished is adapted to be moved during the polishing operation and movable means for pressing the belts into polishing engagement with the rim.

18. In a machine of the character described, two polishing belts, a guide for guiding the motion of a rim, to be polished, between the belts, and shiftable means actuated by the guide for pressing the belts into polishing engagement with the rim during the polishing operation.

19. In a machine of the character described, two polishing belts, a guide for guiding a rim to be polished between the belts, shiftable means for pressing the belts into polishing engagement with the rim during the polishing operation, stops for limiting the motion of the guide relatively to the belt and means for moving the guide and actuating said shiftable means.

20. In a machine of the character described, two polishing belts, a guide for moving the rim to be polished between the belts during the polishing operation, backing rollers for holding an edge of each belt in polishing engagement with the rim on the guide, means for limiting the relative motion between the guide and the belts, shiftable means for pressing the belts into engagement with the rim during the polishing operation and means for actuating the guide and the shiftable means.

21. In a machine of the character described, two polishing belts between which the rim to be polished is adapted to be moved, a yielding backing roller for each belt, a movable guide pulley for each belt, a guide for guiding the rim between the belts, and means actuated by the guide for actuating the guide pulleys to press the belts into polishing engagement with the surface of the rim during the polishing operation.

22. In a machine of the character described, two polishing belts between which the rim to be polished is adapted to be moved, backing rollers provided with yielding edges, for holding the belts in operative positions, a guide for guiding the motion of the rim during the polishing operation, a cam surface for controlling the mo-

tion of the guide and means for actuating the guide and the movable pulleys.

23. In a machine of the character described, a polishing belt and a cam controlled guide for the rim to be polished.

24. In a machine of the character described, two polishing belts, between which the rim to be polished is adapted to be moved, a cam controlled guide for guiding the motion of the rim between the belts, shiftable guide pulleys for moving the belts into polishing engagement with the rim on the guide and means for actuating the pulleys and the guide.

25. In a machine of the character described, two polishing belts, yielding backing rollers for the belts, a pivotally mounted guide for moving the rim to be polished between the belts and means for moving the guide longitudinally along the belts.

26. In a machine of the character described, two polishing belts, between which the rim to be polished is adapted to be moved, a guide for guiding the motion of the rim between the belts and a cam for controlling the motion of the guide.

27. In a machine of the character described, a pair of oppositely disposed polishing belts, a backing roller for each belt, a guide for moving the rim between the belts, and laterally across the polishing faces of the belts, and means for limiting the lateral motion of the guide relatively to the rollers.

28. In a machine of the character described, two oppositely disposed polishing belts, a backing roller for each belt, said backing rollers being oppositely disposed with relation to each other, a pivotally mounted and longitudinally movable support for guiding a rim, to be polished, between the belts to a position adjacent to the rollers and for guiding the rim in a substantially arc-shaped path across the polishing faces of the belts during the polishing operation, and means for limiting the lateral motion of the rim relatively to the backing rollers.

29. In a machine of the character described, a pair of oppositely disposed belts, means for driving said belts, a pivotally mounted and longitudinally movable rim support, for guiding the rim, to be polished, to a position between said belts and for guiding it in a substantially arc-shaped path across the faces of the belts, oppositely disposed backing rollers for the belts, for pressing the belts into polishing engagement with a rim and for yieldingly holding the edges of the belts in engagement with the rim, stops for limiting the oscillatory motion of the rim and movable guide pulleys for moving the belts into polishing engagement with the lateral faces of a rim

located on the support, during the polishing operation.

30. In a machine of the character described, two oppositely disposed polishing belts between which a rim to be polished is adapted to be moved, a separate stationary resilient backing roller for each belt, and a separate movable guide pulley for pressing

each belt into polishing engagement with the lateral face of a rim during the polishing operation. 10

JOHN G. VANCE.

Witnesses:

J. J. WIESNER,
ELIAS FOLK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
