A. L. BUTCHER & H. FLICK.

AUTOMATIC SPOKE SANDING MACHINE.

APPLICATION FILED SEPT. 22, 1914.

1,144,347.

Patented June 29, 1915.

3 SHEETS—SHEET 1.

Fig. IX.

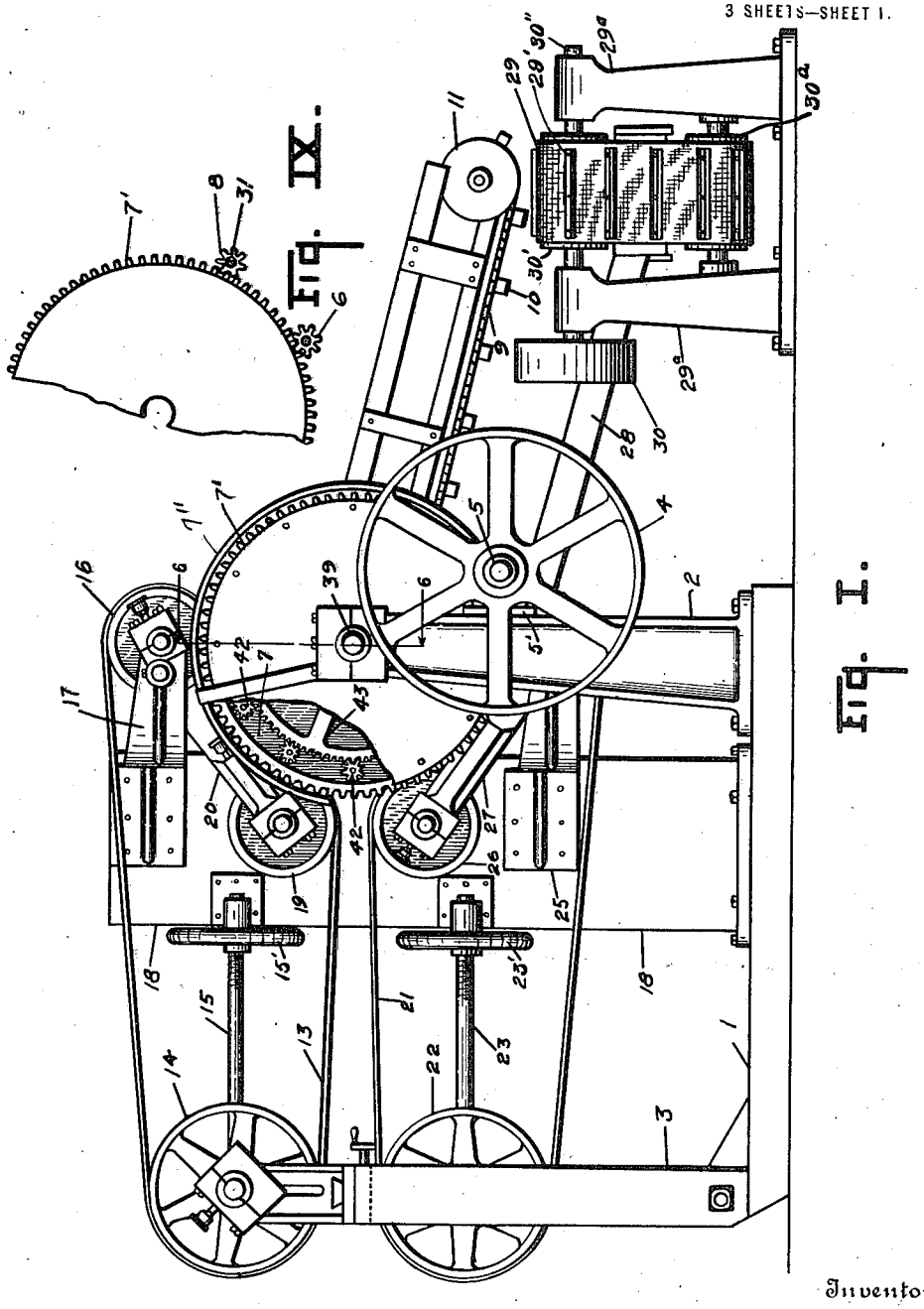


Fig. I.

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Fig. II.

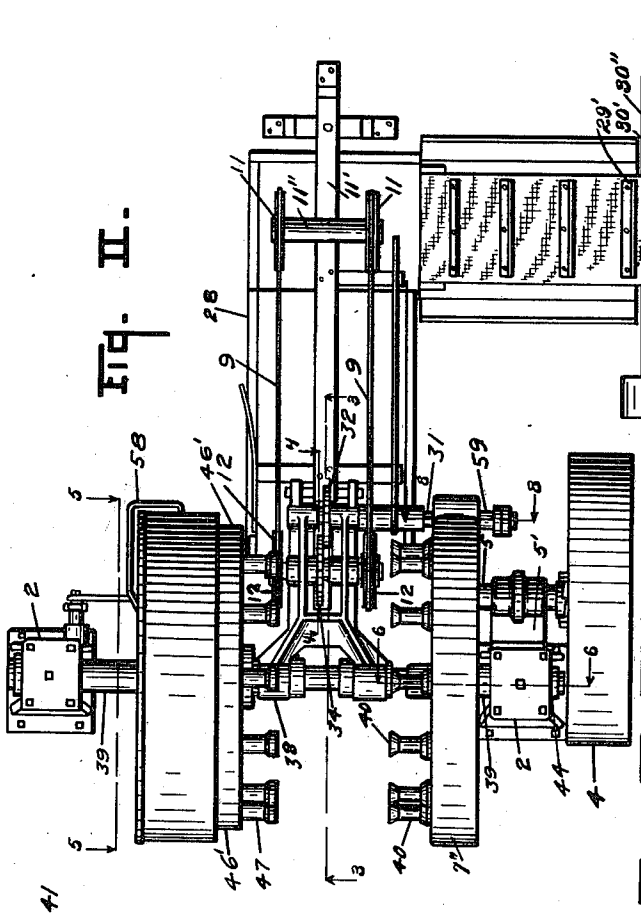


Fig. VIII.

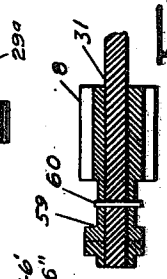


Fig. VI.

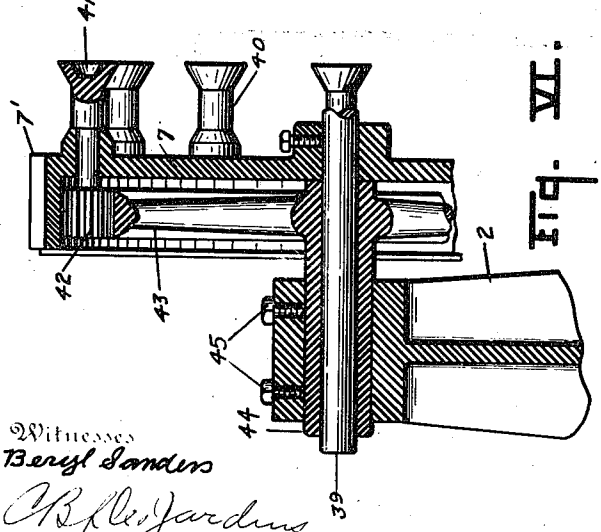
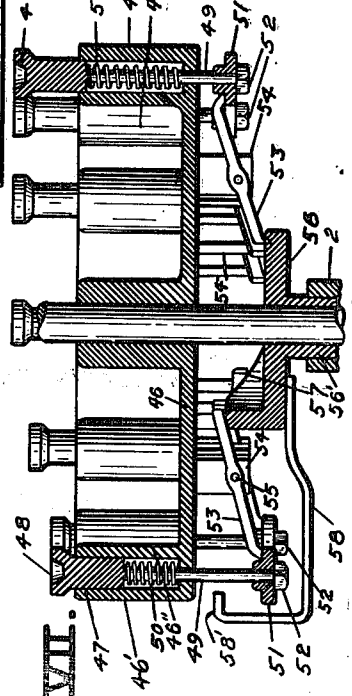


Fig. VII.



Witnesses

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3 SHEETS—SHEET 3.

Fig. III.

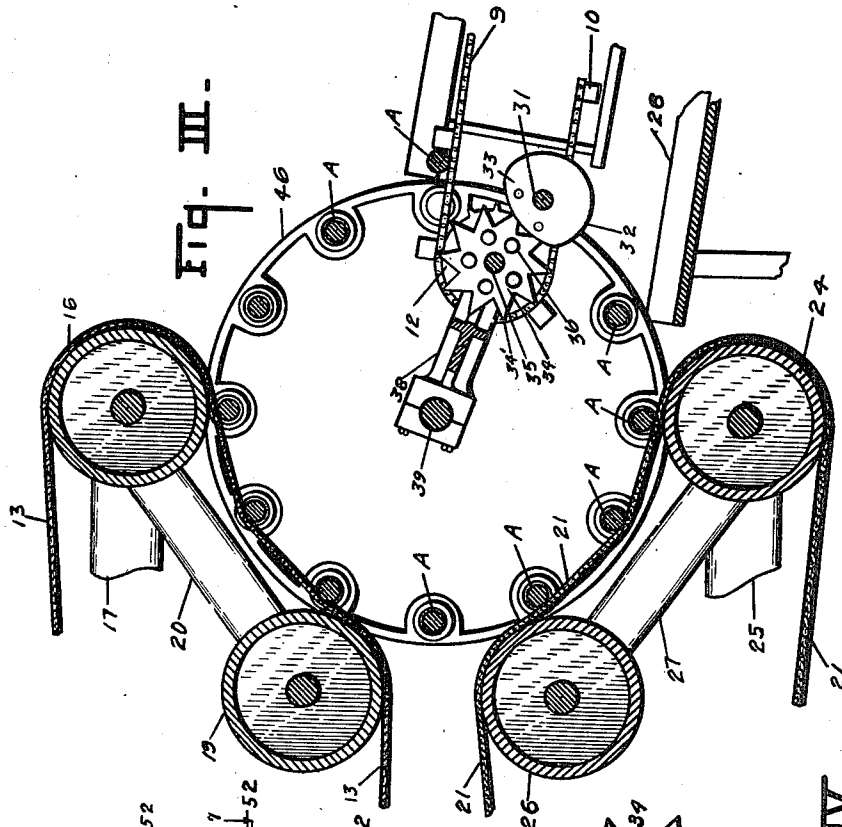


Fig. V.

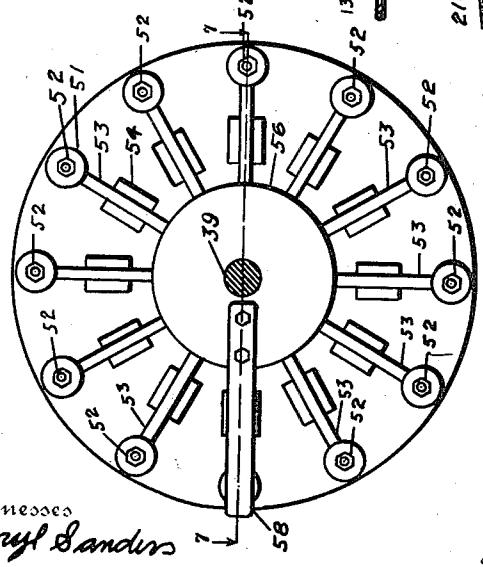
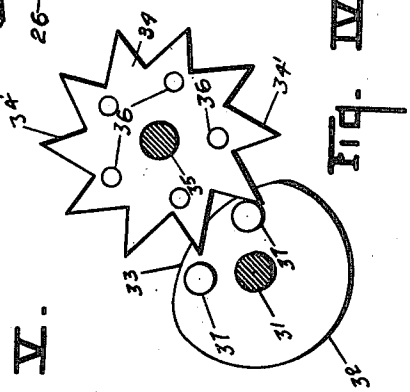


Fig. IV.



Witnesses

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ARTHUR L. BUTCHER AND HENRY FLICK, OF JACKSON, MICHIGAN, ASSIGNORS TO HAYES WHEEL COMPANY, OF JACKSON, MICHIGAN.

AUTOMATIC SPOKE-SANDING MACHINE.

1,144,347. Specification of Letters Patent. Patented June 29, 1915.

Application filed September 22, 1914. Serial No. 862,897.

To all whom it may concern:

Be it known that we, ARTHUR L. BUTCHER and HENRY FLICK, citizens of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Automatic Spoke-Sanding Machines, of which the following is a specification.

This invention relates to improvements in automatic spoke sanding machines.

The objects of this invention are, first, to provide an improved automatic feed for spoke sanding machines; second, to provide an improved arrangement and disposition of sanding belts relative to the spoke carrying mechanism; third, to provide improved driving mechanism for the conveyer chains delivering the spokes to the spoke carrying turret; fourth, to provide improved means for gripping and releasing the spokes.

Further objects, and objects relating to details and economies of construction and operation will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure constituting a preferred embodiment of our invention is illustrated in the accompanying drawing forming a part of this specification, in which:

Figure I is a view in side elevation of a machine embodying our invention, a portion of the turret casing being broken away to show the inner gear for driving the spindles. Fig. II is a top plan view of the machine, the spoke sanding belts and the parts carrying the same being omitted for clearness of illustration. Fig. III is an enlarged detail sectional view on a line corresponding to line 3—3 of Fig. II, the spokes being shown in place in the turret and portions of the sanding belts being shown. Fig. IV is an enlarged detail sectional view on the line 4—4 of Fig. II, showing in detail the mechanism for driving the conveyer chains. Fig. V is an enlarged detail sectional view on a line corresponding to the line 5—5 of Fig. II, the housing for the head being removed. Fig. VI is an enlarged detail fragmentary sectional view on a line corresponding to the line 6—6 of Fig. II, showing the actuating means for the driven spindles. Fig. VII is a transverse detail sectional view on the line 7—7 of Fig. V, showing in detail the means for actuating the spindles 47. Fig. VIII is an enlarged detail sectional view on the line 8—8 of Fig. II, showing the connection between the pinion 8 and the shaft 31. Fig. IX is a detail fragmentary view in side elevation, showing the driving means for the turret and the connection between the turret and the driving means for the feed mechanism.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Considering the numbered parts of the drawing, the base 1 of the machine has the standards 2, 3, and 18 rising therefrom and supporting the various parts of the machine. The upper pulley 14 is journaled in the upright 3 and is driven from a suitable source of motive power. A bracket 17 is carried by the upright 18 and carries the idler pulley 16 and the arm 20 carrying the idler pulley 19 at the lower end thereof. The rough sanding belt 13 is disposed around the upper pulley 14 and the idler pulleys 16 and 19, the portion of the belt between the pulleys 16 and 19 being so disposed relative to the turret that the spokes carried by the latter come in contact with said portion of the belt, as shown in Fig. III. The lower pulley 22 is also journaled in the upright 3 and is driven from a suitable source of motive power. The upright 18 carries a bracket 25 on which is journaled the idler pulley 24, said bracket also carrying the arm 27, at the upper end of which the idler pulley 26 is journaled. The smooth sanding belt 21 is disposed around the lower pulley 22 and the idlers 26 and 24, the portion of said belt between the idlers being disposed so as to come in contact with the spokes carried by the turret. The pulleys 14 and 22 may be adjusted by means of the screw threaded rods 15 and 23 and the hand wheels 15′ and 23′ to adjust the tension of the sanding belts.

The shaft 39 is journaled in the standards 2, 2 and carries the turret comprising the heads 7 and 46, which heads carry the spindles 40 and 47 respectively for receiving the spokes to be sanded. The head 7 is secured

to the shaft 39 and has an external gear 7'. The inner gear 43 is disposed within the head 7 and has a sleeve 44 journaled on the shaft 39 and secured by the set screws 45 to the standard 2. The spindles 40 are rotatably mounted in the head 7 and carry on their inner ends pinions 42 meshing with the inner gear 43. These spindles are disposed in a circle concentric with the gear 43. As the head 7 rotates the engagement of the pinions 42 with the fixed inner gear 43 rotates the spindles 40 so as to turn the spokes which are held thereby and expose all parts of them to the sanding belts. Sockets 41 are provided in the ends of the spindles 40, as clearly shown in Fig. VI.

A bracket 5' is disposed on one of the standards 2 adjacent the head 7 and shaft 5 is journaled in said bracket and carries on its outer end the driving pulley 4 which is connected with a suitable source of power. On the other end of said shaft 5 is secured the pinion 6 meshing with the gear 7', as clearly shown in Fig. IX. This pinion 6 drives the head 7 causing the spindles carried thereby to rotate as the head is revolved. The head 7 is covered by a suitable guard casing 7''. The head 46 is also carried by the shaft 39 and has an inturned flange 46'. Integral with the flange 46' of the head 46 are provided a plurality of sockets 46'' in which are disposed the enlarged portions of the spindles 47. These spindles are provided with reduced portions 49 which extend through the rear face of the head, as shown in Fig. VII. Springs 50 surrounding the spindles, are seated in the sockets 46'' and bear against the shoulders at the ends of the reduced portions 49 so as to normally press the spindles 47 outwardly. Sockets 48 are provided in the ends of said spindles to receive the ends of the spokes. As many of these sockets and spindles are provided as there are spindles 40 in the head 7, the two sets of spindles being disposed in alinement with each other to receive the ends of the spokes.

Upon the rear ends of the reduced portions 49 of the spindles 47 are fixed the disks 51 which are held in place by the nuts 52. Upon the brackets 54 carried by the head 46 are pivoted, at 55, the levers 53, the outer end of each of said levers engaging the corresponding disk 51 on the end of the spindle 47. Cam 56 has a sleeve 56' which is secured to the standard 2 and is fixed against rotation. Cam 56 has the inclined cam surface 57 which is adapted to engage the inner ends of the levers 53 so that during the revolution of the head 46 the inner ends of the levers will be successively depressed to retract successively the spindles 47. This is clearly shown in Figs. VII of the drawing. An arm 58 is secured to the cam 56 and has an inwardly directed end 58' which is adapted to engage the disk 51, which is at that time adjacent to it, to limit its inward movement when released by the cam surface 57.

The forked arm 38 is journaled on the shaft 39 between the heads 7 and 46, and said forked arm 38 has journaled therein the shaft 35 which carries the sprockets 12, 12 and the star wheel 34. A suitable bracket 11' carries the shaft 11'' upon which are journaled the idler sprockets 11, 11, the conveyer chains 9 being carried by said sprockets 11 and 12 respectively. These chains are provided with lugs 10 disposed at intervals and adapted to engage a spoke to carry it up into position to be gripped by the spindles 40 and 47, as shown in Fig. III of the drawing.

Shaft 31 is journaled in the end of the forked arm 38 and carries a pinion 8 disposed in mesh with the gear 7' on the head 7 so that the pinion 8 and the shaft 31 are driven by the head 7 as it rotates. The pinion 8 has a sleeve 59 which is journaled on the shaft 31 and is connected to said shaft by a pin 60. This pin 60 is of soft metal which can be easily sheared so that if the conveying chains 9, 9 are clogged or stopped for any reason whatsoever the pin 60 will be sheared and allow the pinion 8 to rotate freely without turning the shaft 31. This is a safety device for preventing damage to other parts of the machine in case a spoke should catch and clog the conveying chains 9.

Upon the shaft 31 is secured the wheel 33 provided with the pins 37, 37 and coacting with the star wheel 34 and the pins 36, 36 carried thereby to drive the shaft 35 with an intermittent movement. As the shaft 31 rotates the pins 37, 37 engage the teeth 34 of the star wheel and cause it to rotate for a part of a revolution. The portion 32 of the periphery of the wheel 33 is concentric with the shaft 31 and engages the pins 36 of the star wheel acting as a lock to prevent any rotation of the star wheel 34 and the shaft 35 while the part 32 is in engagement with the pins 36.

The cam 57 is so disposed that the spindles 47 are retracted as they approach the star wheel 34 and are projected by the springs 50 just as they pass the upper lengths of the chains 9 so that the spindles will grip a spoke carried on the chain 9 and carry it around, during the revolution of the turret, past the sanding belts 13 and 21 and finally release the spoke at a point just below the star wheel so that the spoke will drop into the trough or chute 28 and slide downwardly toward the bottom thereof.

On suitable uprights 29a the shaft 30'' is journaled, carrying the pulley 30'. The pulley 30' and the shaft 30'' are driven from the pulley 30 connected with a suitable source of motive power. A conveying belt 29 is dis-

posed around the pulley 30′ and an idler pulley 30ª and said conveying belt has a plurality of flights 29′ adapted to engage the spokes which are deposited at the bottom of the chute 28 to carry them upwardly to a point adjacent the pulley 30′ where they are dumped into a cart or truck which has been brought into position to receive them.

From the description of the parts given above, the operation of the machine should be very readily understood. The spokes A are placed upon the conveying chains 9 in front of the lugs 10 and are carried by said chains upwardly into position to be gripped by the corresponding spindles 40 and 47, the ends of the spokes fitting in the sockets 41 and 48 of said spindles. The machine is so timed that, when the spoke is brought into proper position to be gripped by the spindles the adjacent spindle 47 will be released and projected by means of the spring 50 so as to engage the end of the spoke and force the other end thereof into engagement with the socket 41 of the spindle 40. The spoke is then carried by the rotation of the turret upwardly and rearwardly into engagement with the rough sanding belt 13 as shown in Fig. III, and then downwardly and forwardly into engagement with the smooth sanding belt 21 to a point near the initial position where the inner end of the lever 53 engages the cam 57 retracting the spindle 47 and allowing the spoke to drop into the chute 28 down which it slides to the end thereof where it is engaged by the conveyer belt 29 and dumped into the waiting cart or truck. As the spokes are carried around in the turret they are revolved by means of the pinions 42 meshing with the gear 43. The conveyer chains 9 are driven with an intermittent movement from the gear 7′ through the pinion 8, the shaft 31 and the star wheel mechanism 34. The pinion 8 is connected to the shaft 31 by the pin 60 which will be readily sheared in case the conveyer chains are stopped so as to permit the pinion 8 to rotate freely.

We are aware that the particular form of our invention which we have here shown is susceptible of considerable variation without departing from the spirit of our invention and, therefore, we do not wish to be restricted to the same. We have found, however, that this particular form is to be preferred and, therefore, we desire to claim the same specifically, as well as broadly, as indicated by our appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a machine of the class described, the combination of a base, standards carried thereby, a main shaft journaled in said standards, a head fixed on said shaft, a plurality of spindles rotatably mounted in said head, connections for rotating said spindles as said head revolves, an external gear on said head, a suitably journaled driving shaft, a pinion on said driving shaft meshing with said external gear, a second head fixed on said main shaft, a plurality of sockets formed in said head, a spindle slidably mounted in each socket, each spindle having a reduced portion extending through said head, a spring for each of said spindles tending to project the same, disks carried by the reduced portions of said spindles, a plurality of levers mounted on said head having their outer ends engaging said disks, a fixed block having a cam surface thereon adapted to engage the inner ends of said levers to retract the spindles, a stop arm secured to said block and having an inturned end adapted to engage the disk on the end of each spindle as it is projected, an arm journaled on the main shaft, a shaft journaled in the end of said arm, a pinion on said shaft meshing with the external gear on the first named head, an eccentric disk on said shaft, a pair of pins on said disk, a second shaft journaled in said arm, a toothed wheel on said second shaft, a plurality of pins on said wheel adapted to be engaged by a portion of the periphery of said eccentric disk to hold said toothed wheel against movement, the teeth of said wheel being adapted to be engaged by the pins on said eccentric disk to rotate said wheel, a pair of sprocket wheels mounted on said last named shaft, a pair of sprocket chains carried and diven by said sprocket wheels and adapted to deliver spokes into position to be received by said spindles, and a pair of sanding belts disposed to act upon the said revolving spokes during the revolution of said head, all coacting substantially as described for the purpose specified.

2. In a machine of the class described, the combination of a base, standards carried thereby, a main shaft journaled in said standards, a head fixed on said shaft, a plurality of spindles rotatably mounted in said head, an external gear on said head, a second head fixed on said main shaft, a plurality of spindles slidably mounted in said head, an arm journaled on the main shaft, a shaft journaled in the end of said arm, a pinion on said shaft meshing with the external gear on the first named head, an eccentric disk on said shaft, a pair of pins on said disk, a second shaft journaled in said arm, a toothed wheel on said second shaft, a plurality of pins on said wheel adapted to be engaged by a portion of the periphery of said eccentric disk to hold said toothed wheel against movement, the teeth of said wheel being adapted to be engaged by the pins on said eccentric disk to rotate said wheel, a sprocket wheel mounted on said last named shaft, a conveyer chain carried and

driven by said sprocket wheel and adapted to deliver spokes into position to be received by said spindles, and a sanding belt disposed to act upon the said revolving spokes during the revolution of said head, all coacting substantially as described for the purpose specified.

3. In a machine of the class described, the combination of a base, standards carried thereby, a main shaft journaled in said standards, a head fixed on said shaft, a plurality of spindles rotatably mounted in said head, an external gear on said head, means for driving said head, a second head, a plurality of spindles slidably mounted in said head, an arm journaled on the main shaft, a shaft journaled in the end of said arm, a pinion on said shaft, a soft metal pin connecting said pinion to said shaft, said pinion meshing with the external gear on the first named head, an eccentric disk on said shaft, a pin on said disk, a second shaft journaled in said arm, a toothed wheel on said second shaft, the pin on said eccentric disk being adapted to engage said wheel to rotate the same, a sprocket wheel mounted on said last named shaft, a conveyer chain carried and driven by said sprocket wheel and adapted to deliver spokes into position to be received by said spindles, and a sanding belt disposed to act upon the said revolving spokes during the revolution of said head, all coacting substantially as described for the purpose specified.

4. In a machine of the class described, the combination of a base, standards carried thereby, a main shaft journaled in said standards, a head fixed on said shaft, a plurality of spindles rotatably mounted in said head, a second head fixed on said main shaft, a plurality of spindles slidably mounted in said head, an arm journaled on the main shaft, a shaft journaled in the end of said arm, driving connections between the first named head and said shaft, an eccentric disk on said shaft, a pin on said disk, a second shaft journaled in said arm, a toothed wheel on said second shaft, the pin on said disk being adapted to engage the teeth of said wheel to rotate the same, a sprocket wheel mounted on said last named shaft, a conveyer chain carried and driven by said sprocket wheel and adapted to deliver spokes into position to be received by said spindles, and a sanding belt disposed to act upon the said revolving spokes during the revolution of said head, all coacting substantially as described for the purpose specified.

5. In a machine of the class described, the combination of a base, standards carried thereby, a main shaft journaled in said standards, a head fixed on said shaft, a plurality of spindles rotatably mounted in said head, a second head fixed on said main shaft, a plurality of spindles slidably mounted on said head, an arm journaled on the main shaft, a shaft journaled in said arm, a sprocket wheel on said shaft, a conveyer chain carried and driven by said sprocket wheel and adapted to deliver spokes into position to be received by said spindles, means for imparting intermittent movement to said last named shaft, and a sanding belt disposed to act upon the said revolving spokes during the revolution of said head, all coacting substantially as described for the purpose specified.

6. In a machine of the class described, the combination of a base, standards carried thereby, a main shaft journaled in said standards, a head fixed on said shaft, a plurality of spindles rotatably mounted in said head, a second head fixed on said main shaft, a plurality of spindles slidably mounted in said head, means for successively projecting each of said spindles to grip a spoke, means for successively retracting each of said spindles to release a spoke, conveying means adapted to deliver spokes into position to be gripped by said spindles, means for driving said conveying means with an intermittent movement, and a sanding belt disposed to act upon the said revolving spokes during the revolution of said head, all coacting substantially as described for the purpose specified.

7. In a machine of the class described, the combination of a base, standards carried thereby, a main shaft journaled in said standards, a turret fixed on said shaft, a plurality of spindles carried by said turret and adapted to receive the spokes to be sanded, means for rotating said spindles as the turret is rotated, automatic means for gripping said spokes, automatic means for releasing said spokes, automatic means for delivering spokes into position to be gripped by the spindles, and a sanding belt disposed to act upon the said revolving spokes during the revolution of said turret, all coacting substantially as described for the purpose specified.

8. In a machine of the class described, the combination of a base, standards carried thereby, a main shaft journaled in said standards, a turret fixed on said shaft and provided with a plurality of spindles adapted to receive the spokes to be sanded, means for rotating said spindles as the turret is rotated, automatic means for delivering spokes to said spindles and a sanding belt disposed to act upon the said revolving spokes during the revolution of the turret.

9. In a machine of the class described, the combination of a base, standards carried thereby, an upper and lower set of pulleys journaled on said standards, a rough sanding belt disposed over the upper set of said pulleys, a smooth sanding belt disposed

over the lower set of said pulleys, a main shaft journaled in said standards, a turret on said shaft provided with a plurality of spindles adapted to receive the spokes to be sanded, means for rotating said spindles as the turret is rotated, said sanding belts being disposed with portions thereof in position to act upon the said revolving spokes during the revolution of said turret.

10. In a machine of the class described, a suitable base and framework, a turret in said framework with means for revolving the same, a plurality of spindles carried by said turret and adapted to receive spokes to be sanded, means for revolving the said spindles as the turret is advanced, means for gripping the said spokes, means for rotating the same as the turret advances, a rough sanding belt disposed to act upon the said spokes immediately after they are received in the machine, and a smooth sanding belt disposed in proximity to the turret and arranged to act upon and finish the spokes after the action of the rough belt, and automatic means for releasing the spokes after they are finished, as specified.

11. In a machine of the class described, a suitable base and framework, a turret in said framework with means for revolving the same, a plurality of spindles carried by said turret and adapted to receive spokes to be sanded, means for revolving the said spindles as the turret is advanced, automatic means for gripping the said spokes, means for rotating the same as the turret advances, a rough sanding belt disposed to act upon the said spokes immediately after they are received in the machine, and a smooth sanding belt disposed in proximity to the turret to act upon and finish the spokes, and automatic means for releasing the spokes after they are finished, as specified.

In witness whereof, we have hereunto set our hands and seals in the presence of two witnesses.

ARTHUR L. BUTCHER. [L. S.]
HENRY FLICK. [L. S.]

Witnesses:
J. W. SHEPHERD,
WM. SCHEIFFLER.