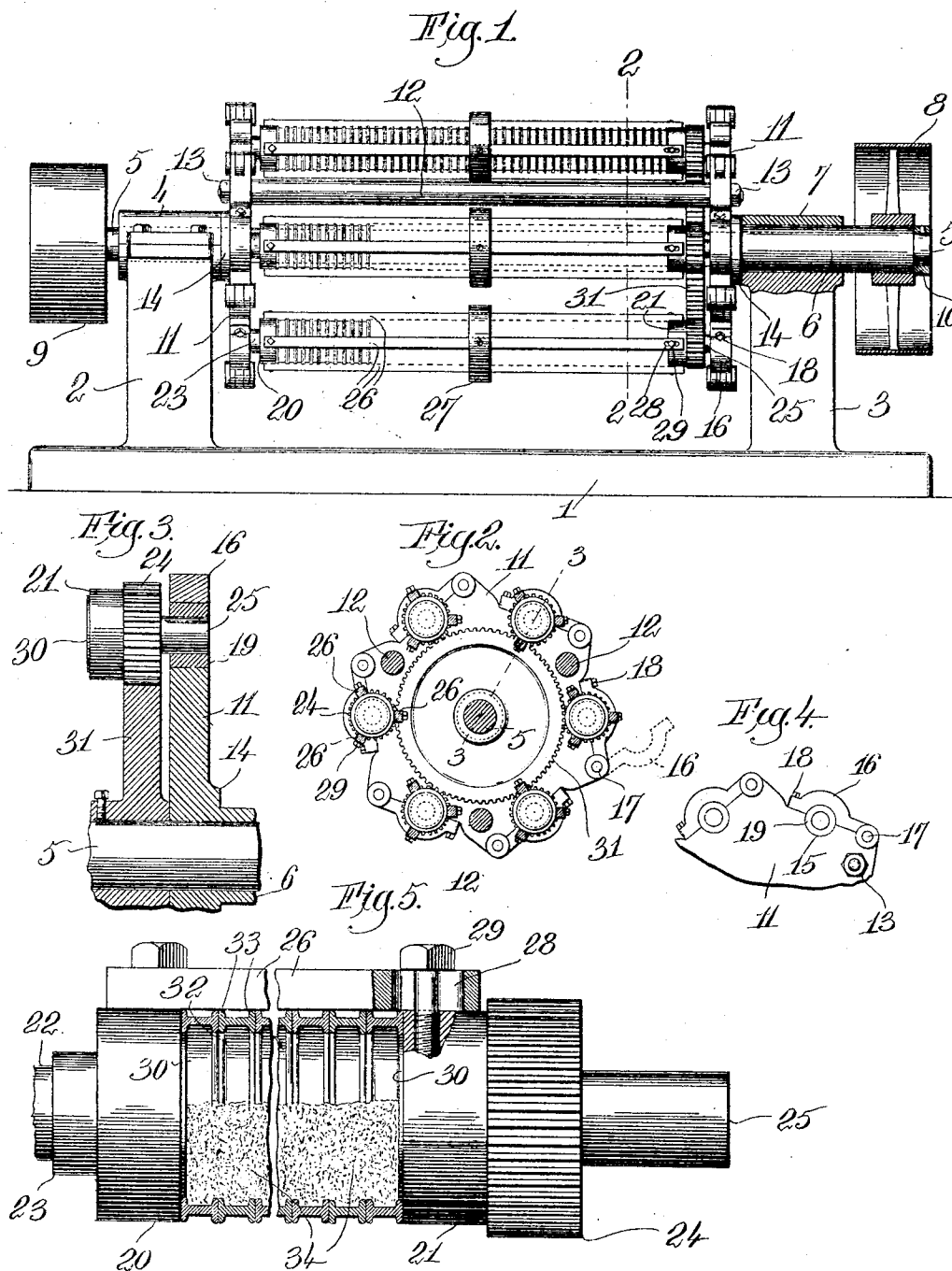


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F. H. THOMPSON.
APPARATUS FOR POLISHING SPINNING RINGS.
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR POLISHING SPINNING-RINGS.

No. 805,245.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK H. THOMPSON, a citizen of the United States, and a resident of Milford, in the county of Worcester and State of Massachusetts, have invented an Improvement in Apparatus for Polishing Spinning-Rings, of which the following description, in connection with the accompanying drawings, is a specification, like figures on the drawings
10 representing like parts.

The flanged rings which form the traveler-raceways on ring-spinning frames require a very smooth and highly-polished inner surface in order to reduce as much as possible the friction between the inner ends of the traveler and the ring and afford a true bearing-surface for the traveler. Various modes of polishing the inner surfaces of the rings have been devised, but they are slow and require considerable skill in order to smooth and polish the desired surface, particularly in the case of double-flanged rings of a type in extended use.

This invention has for its object the production of a simple, novel, and efficient apparatus for quickly and uniformly imparting a high polish and uniformly smooth surface to the interiors of a large number of rings at a time, the action of centrifugal force being
30 made effective in applying the polishing material to the ring-surface to be treated.

The various novel features of my invention will be fully described in the subjoined specification, and particularly pointed out in the following claims.

Figure 1 is a front elevation of a ring-polishing apparatus embodying one form of my invention, one of the bearings for the rotatable carrier being broken out. Fig. 2 is a cross-section of the apparatus on the line 2 2, Fig. 1, looking toward the right. Fig. 3 is an enlarged radial sectional detail taken on the line 3 3, Fig. 2, the pinion and connected portions being shown in elevation. Fig. 4 is a side elevation of a portion of the outer face of one of the heads of the carrier, to be described; and Fig. 5 is an enlarged detail, centrally broken out, of one of the ring-holders, the stack or group of rings held therein being shown in section, with the polishing material in the closed-end ring-tube.

Referring to Fig. 1, a base or bed plate 1 is provided with upright standards 2 3, the

former having a bearing 4 for one end of a horizontal shaft 5, extended loosely through an elongated sleeve 6, rotatably mounted in a bearing 7 on the standard 3. A belt-pulley 8 is secured to the outer end of the sleeve, and a similar pulley 9 is secured to the opposite end of the shaft 5 beyond the bearing 4, a collar 10 being fixed on the shaft at the outer end of the sleeve 6, as shown at the right, Fig. 1. A carrier is rotatably mounted on the shaft, the carrier comprising two like heads 11, preferably made as castings, rigidly connected and maintained a predetermined distance apart by longitudinal bars 12, reduced at their ends to pass through holes in the heads and threaded to receive nuts 13, clamping the heads and bars together. Three of the bars are shown in cross-section, Fig. 2, arranged symmetrically around the shaft 5. The head adjacent the sleeve 6 is secured to or forms a part of the latter, and bosses 14 on the outer faces of the heads cooperate with the inner ends of the bearings 4 and 7 to prevent any longitudinal movement of the carrier, which is rotated by means of a belt (not shown) passed around the pulley 8 from a suitable source of power. I have provided each head with a series of circularly-arranged bearings for the journals of ring-holders, to be described, each bearing comprising a seat 15 and a cap 16, pivoted on the head at 17 (see Fig. 4) and held closed by a stud-bolt 18, the bearing having a suitable bushing 19. Referring to Fig. 2, the bearings are arranged at equal distances apart, two bearings between each two bars 12 of the carrier.

Inasmuch as the ring-holders or cages are of like construction, only one will be described in detail, it comprising two thick strong disk-like end members 20 and 21, the former having an outwardly-extended journal 22, shouldered at 23, while the member 21 has adjacent its outer face a pinion 24 and a projecting journal 25 in alinement with the journal 22. (See Figs. 1 and 5.) Herein three equidistant elongated side rods 26 are fixedly secured to the periphery of the disk 20 and midway between their ends are embraced by and secured to a ring 27, (see Fig. 1,) the opposite ends of the side rods having elongated slots 28 to receive the shanks of clamping-bolts 29, which enter threaded holes in the periphery of the disk 21. When the bolts are set up, a cage is

formed comprising the solid end disks and the side rods, the journals 22 and 25, entering opposite bearings in the heads of the carrier, the pinions 24, lying inside the right-hand carrier-head, viewing Fig. 1. A slight annular enlargement 30 is made on the inner face of each disk for a purpose to be described.

The shaft 5, which is rotatable from the pulley 9 independently of the carrier, has secured to it near the inner face of the right-hand head (see Fig. 1) a large gear 31, adapted to mesh with the pinions 24 of the several ring-holders or cages, so that the latter may be given axial relation while they are rotated bodily around the axis of the carrier.

The apparatus herein shown is designed more especially for polishing the inner surfaces of double-flanged spinning-rings, which, as shown in Fig. 5, comprise an annular web 32 and like flanges 33 at the top and bottom of the web.

In arranging the apparatus the end member 21 is removed from the ring-holder by withdrawing the bolts 29, and a group of the rings are stacked up in the holder, the rings being slipped in between the side rods 26, the inner faces thereof being so disposed as to lie across the outer edges of the ring-flanges, the end-most ring of the group fitting around the enlargement 30 of the disk 20. The side rods maintain the group of rings in axial alinement, the top flange of one ring resting upon the bottom flange of the next, as shown in Fig. 5, making a tube of rings. The disk 21 is applied after polishing material (indicated at 34) is introduced into the ring-tube, and when the disk is in position to force the rings tightly together the bolts 29 are set up, clamping the group of rings firmly in place in the holder. The latter is then positioned on the carrier and the caps 16 are secured in place by the stud-bolts 18, the pinion 24 meshing with the large gear 31. Similarly the other ring-holders are filled and placed in position on the carrier. The polishing material, which I have found very effective, is composed of a mixture of iron filings and emery; but any suitable polishing material may be used. The apparatus is now started, the carrier being rotated at such a rate of speed that the centrifugal force will throw the polishing material outward against the outermost wall of each tube of rings. At the same time axial rotation of the ring holders or cages is effected by rotating the shaft 5 and its attached gear 31 oppositely to the direction of rotation of the carrier or in the same direction at a higher speed. In either case the ring-tubes will be rotated axially, and thereby the polishing material will be caused to act uniformly and evenly upon the entire inner surfaces of the rings forming the tubes. The higher the speed of rotation of the carrier the greater will be the force with which the polishing material will act upon the exposed surfaces of

the rings, and the more rapid the axial rotation of the rings the quicker the polishing will be effected. It will be manifest that mere axial rotation would cause the polishing action to depend only on the weight of the polishing material, and bodily rotation of the tubes of rings about the horizontal axis of the carrier would only force the material against the inner surfaces of the rings at one place; but by the combined action of the two rotations simultaneously effected a very smooth and highly-polished surface is rapidly and easily effected with great uniformity, the polishing material acting on the irregular inner surface of each ring with perfect ease.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In apparatus of the class described, means to maintain a group of rings pressed together in axial alinement and thereby form a tube, and mechanism to effect simultaneously axial rotation of the ring-tube and bodily rotation thereof about a horizontal axis, whereby polishing material introduced into the ring-tube will act uniformly upon and polish the inner surfaces of the rings.

2. In apparatus of the class described, means to maintain a group of rings pressed together in axial alinement and thereby form a tube, a horizontally-rotatable carrier, on which the ring-tube is rotatably mounted eccentric to the carrier-axis, and mechanism to effect simultaneous axial rotation of the ring-tube as the latter is rotated bodily by the carrier.

3. In apparatus of the class described, a horizontally-rotatable carrier, means mounted thereon to maintain a plurality of groups of rings in parallelism eccentric to its axis, the rings of each group being pressed together in axial alinement to form a ring-tube and closed at each end, and mechanism to effect simultaneous axial rotation of the several ring-tubes as the latter are rotated bodily about the carrier-axis.

4. In apparatus of the class described, holding means, including end-closers, to press together and maintain in axial alinement a group of rings, forming a tube with closed ends, a carrier rotatable about a horizontal axis and adapted to rotatably support a plurality of such holding means parallel to the carrier-axis, and means to effect axial rotation of the several holding means simultaneously with the bodily rotation of said holding means with the carrier.

5. In apparatus of the class described, a horizontally-rotatable carrier comprising rigidly-connected heads provided each with a circularly-arranged series of bearings, a series of ring-cages rotatably mounted in the bearings, each cage having end pieces and connecting side rods, to receive and clamp together in axial alinement a group of rings, the end pieces closing the tube of rings, and means to effect

axial rotation of each cage simultaneously with the bodily rotation thereof by the carrier.

6. In apparatus of the class described, a horizontally-rotatable carrier comprising rigidly-connected heads provided each with a circularly-arranged series of bearings, a series of ring-cages rotatably mounted in the bearings, each cage comprising two opposite end disks each having an outwardly-extended journal, a pinion on one of said disks, and elongated side rods adjustably connecting the end disks, a group of rings being clamped together between the disks and maintained in axial alignment by the side rods, forming a ring-tube having closed ends and adapted to receive the polishing material, the journals being detachably mounted in the carrier-heads, and a gear adapted to mesh with the several pinions and rotated independently of the carrier, whereby individual axial rotation of each cage is effected simultaneously with the bodily rotation by the carrier.

7. In apparatus of the class described, a horizontally-rotatable carrier comprising rigidly-connected heads provided each with a circularly-arranged series of bearings, a series of ring-cages rotatably mounted in the bearings, each cage comprising two opposite end disks, elongated side rods connecting said disks, adjustably and detachably secured to one of the disks, and a journal on each disk to enter the bearings on the carrier, the disks clamping together a group of rings held in axial alignment by the side rods, and means to effect axial rotation of the several cages simultaneously with their bodily rotation by the carrier.

8. In apparatus of the class described, a horizontally-rotatable carrier, a series of ring-cages detachably and rotatably mounted thereon symmetrically with respect to its axis, each cage being adapted to clamp together in axial alignment a group of rings and to close the ends of the tube thereby formed, and means to effect opposite and axial rotation to the ring-cages as they are rotated bodily by the carrier, to cause a uniform action of polishing material in the ring-tubes, said material being thrown against the inner surfaces of the rings by centrifugal force.

9. In apparatus of the class described, a horizontally-rotatable carrier, a series of ring-cages detachably mounted thereon in a circle around its axis, each cage being adapted to clamp flange to flange and in axial alignment a

group of double-flanged rings and to close the ends of the ring-tube so formed, and means to positively effect axial rotation of the several ring-tubes as they are rotated bodily by the carrier.

10. In apparatus of the class described, a horizontally-rotatable carrier, a series of ring-cages detachably mounted thereon in a circle around its axis, each cage comprising two end members, elongated side rods fixedly connected with one member, adjustable clamping connections between said rods and the other end member, to clamp together and maintain in axial alignment a group of rings and to close the ends of the tube formed thereby, a pinion on each cage, and a gear coaxial with the carrier and rotatable independently thereof, to mesh with the pinions and thereby effect axial rotation of the cages as they are rotated bodily by the carrier.

11. In apparatus of the class described, a carrier rotatable about a horizontal axis, means mounted on the carrier to clamp together a plurality of spinning-rings in axial alignment and thereby form a tube, rotation of the carrier effecting bodily rotation of said tube about the axis of the carrier, and means to effect simultaneous axial rotation of the clamped rings, whereby polishing material introduced into the tube will be forced outward by centrifugal force against the inner surfaces of the rings and its action thereupon equalized by the axial rotation.

12. In apparatus of the class described, a horizontally-rotatable carrier, means thereon to maintain a plurality of rings pressed together in axial alignment eccentric to the axis of the carrier, whereby the tube of rings so formed will be rotated bodily, said means including closures for the ends of the tube, and mechanism to effect axial rotation of the ring-holding means, whereby polishing material introduced into the ring-tube will be forced outwardly by centrifugal action and its effect upon the inner surfaces of the rings equalized by their axial rotation.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK H. THOMPSON.

Witnesses:

GEORGE OTIS DRAPER,
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