

Aug. 22, 1933.

C. E. PARKHURST

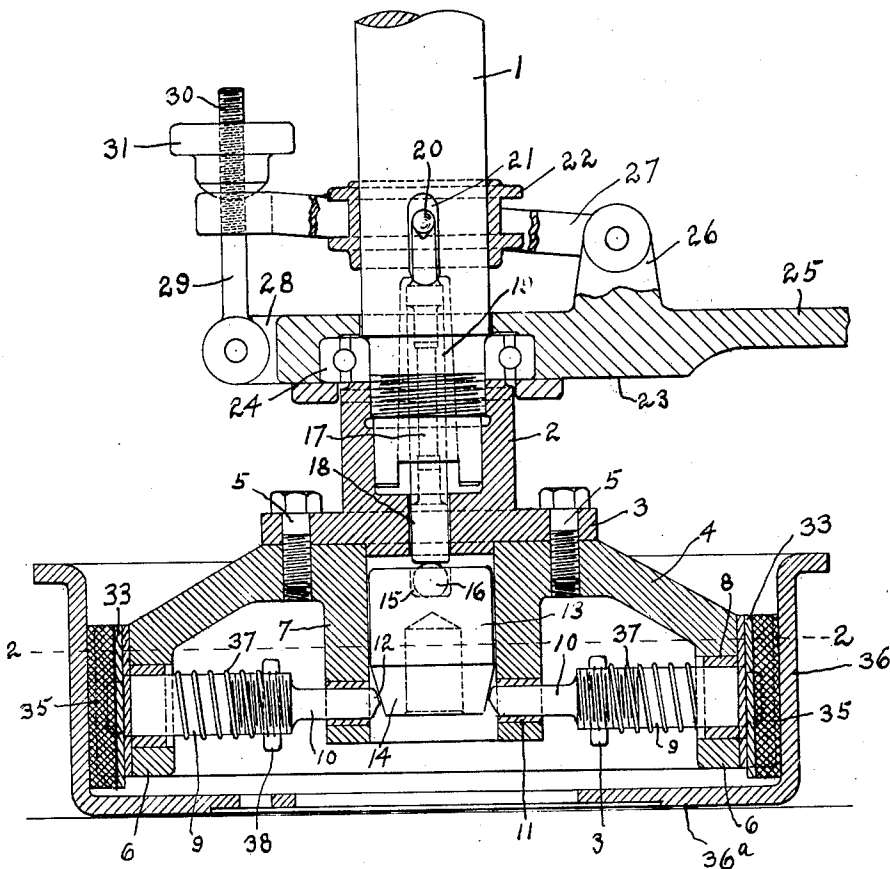
1,923,390

LAPPING MACHINE

Filed Feb. 15, 1932

2 Sheets-Sheet 1

FIG 1



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FIG II

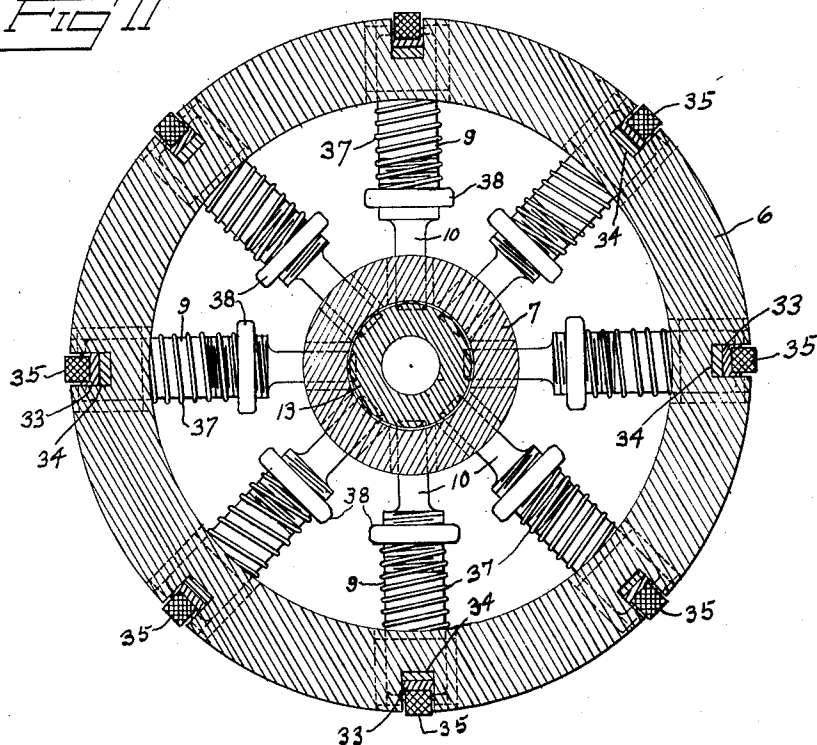
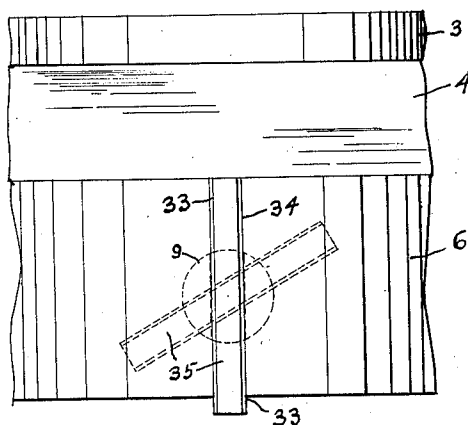


FIG III



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UNITED STATES PATENT OFFICE

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LAPPING MACHINE

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Application February 15, 1932. Serial No. 593,015

4 Claims. (Cl. 51—184.3)

My invention has reference to a lapping or honing machine, and as set forth herein it embodies a mechanism more specially designed for use on the inner wall of a brake drum, or other cylindrical body having a closure or other obstacle at one of its ends or within its bore, which interferes with the movement of the lapping tool entirely through the piece of work. The invention consists of a lapping head, supported by a spindle in the usual manner, so as to be capable of a rotary movement, and also movable axially, for translation of the head toward and into a piece of work and the consequent retraction of the head therefrom. The head is of circular formation, and is provided at intervals on its periphery with stones of abrasive material. By means of other instrumentalities carried by the lapping head the stones may be adapted and adjusted to their work.

Stones of the kind mentioned are usually in the form of blocks of a length corresponding approximately with that of the head with which they are connected, and in the performance of said blocks they are moved gradually into the part that is being honed, with the result that the ends of the stones which first enter the piece of work perform a greater part of the operation than the ends of the stones that follow, and possibly enter the work for a short distance only. As a result the stones become worn unevenly, with a tendency to assume a wedge or tapered form, with the face of the stone inclined from one end to the other, rendering the same inefficient and useless and calling for the discarding thereof.

One of the purposes of the present invention is to provide supports for the stones of such a character that they can be quickly reversed in position upon becoming worn, as above mentioned, and, upon being again put in use, neutralize and correct the unequal condition.

Another feature of the invention consists in the provision of novel mechanism for the adjustment of the stones to their work, so as to gradually increase the working circumference of the tool as the work progresses. Associated therewith is means for holding the stones yieldably against outward movement.

The above named, and other features and advantages of the invention will more fully appear from the following specification, reference being had to the accompanying drawings, in which;—

Fig. 1 is a vertical medial section of a lap-

ping head, as it appears in operation in a brake drum, which is also sectioned.

Fig. 2 is a horizontal section on the broken line 2—2 of Fig. 1.

Fig. 3 is a fragmentary view of the outer rim of the lapping head, showing one of the stones 33, and the manner of reversing the position thereof.

The figures of the drawings are confined to the lapping head and parts immediately associated therewith, it being understood that said mechanisms form parts of a larger machine, containing the usual feeding and driving elements for the head.

The reference number 1 indicates a spindle, vertically disposed as set forth herein, to the lower end of which spindle is connected a coupling 2, provided with an annular flange 3, with which is connected the web 4 of a lapping head, by means of bolts 5. Projected downwardly from said web is a circular head 6, centrally of which is a cylindrical core 7 also depending from the web portion 4. In the wall of the head 6 is a plurality of bushings 8, in which are slidably and rotatably mounted shafts 9, reduced at their inner ends into pins 10, rotatably mounted in bearings 11 in the core 7. The ends of the pins 10 are beveled at 12 to conform to the lower part of a cylindrical expansion element 13 supported in the core 7 so as to be movable freely therein. The lower part 14 of said element is in the form of an inverted frustum, and said expansion element is supported entirely by the ends of the inwardly projecting pins 10, so as to move freely or "float" in said core.

In the upper end of the element 13 is a recess 15, containing an anti-friction ball 16, upon which rests the lower end of a rod 17, passing upwardly through an opening 18 in the lower part of the coupling 2 and a bore 19 in the lower end of the spindle 1. Fixed to the upper end of the rod 17 is a cross-pin 20, the ends of which pass outwardly through a slot 21 in the spindle 1, and are connected with a collar 22 slidable on said spindle. On the lower end of the spindle 1 is mounted a plate 23, separated from the spindle by a ball-bearing outfit at 24, permitting rotation of the spindle independently of said plate. At one end the plate 23 is extended into an arm 25, shown partly broken away, and designed for a vertical slidable connection with a fixture in proximity to the lapping head, as, for instance, the main column of the machine.

Supported on the plate 23 is a bracket 26 in which is pivoted one end of a yoke-arm 27, and provided at its other end with a recess 28 in which is pivoted an upwardly extended bolt 29.

5 On the threaded end 30 of said bolt is a thumb-nut 31, by the proper operation of which the yoke-arm 27 and rod 17 can be forced downwardly, imparting a similar movement to the expansion element 13.

10 To the outer ends of the shafts 9 are attached shoes 33, held loosely in recesses 34 in the rim of the head 6, transversely of said rim. Fixed in said shoes are stones 35, of suitable abrasive material, and adapted for operation in the inner wall of an automobile brake drum, indicated at 36, and having an end portion at 36^a, partially closing the same, and limiting the movement of the stones downwardly. On each of the shafts 9 is a coiled spring 37, interposed
20 between the bushing 8 and a collar-nut 38, having a threaded engagement with the shaft, for adjustment thereon to increase or diminish the force of the spring. As the stones 35 are fed into the work the lower ends thereof sustain
25 the greater amount of wear, and as the stones become worn so as to be out of true they may be inverted in position, by engaging the ends thereof with the fingers of the hand and drawing the stone and its mounting outwardly until they are clear of the head 6. The stone and its shoe can then be turned end for end, in the manner shown in broken lines in Fig. 3, and said parts re-seated in the channel 34. In this
30 operation the spring 37 is compressed, increasing the tension thereof, and upon the stone being released it is again held yieldably in place by the spring.

It will be noted that the action of the mechanism for radial adjustment of the stones is a
40 positive one, and works against the force of the springs 37. When the work of the tool is started in a brake-drum the stones are properly positioned by the operation of the thumb-nut 31, and as the work proceeds the wear upon the stones or upon the wall of the drum can be compensated for by additional adjustment of the thumb-nut, to further expand the circle of the abrasive elements.

The stones 35 and their supporting shoes are
50 formed to project downwardly beyond the wall of the head 6, as shown, so as to give ample clearance for said stones in the lower part of the drum.

What I claim, and desire to secure by Letters
55 Patent, is:—

1. In a lapping machine, a spindle mounted to rotate and reciprocate, a circular head fixed to said spindle, a plurality of stones mounted piv-

otally on the periphery of said head, and means for holding said stones normally and yieldably against a reversal in position.

2. In a lapping machine, a spindle mounted for rotation and reciprocation, a head fixed to said spindle comprising an outer circular wall provided in its rim with transverse channels and a central cylindrical mounting, spaced from said wall, a plurality of shafts journaled in said wall at one end and in the mounting at the other end, and having extensions into said mounting, shoes fixed to the outer ends of said shafts and normally positioned in said channels, stones fixed in said shoes, springs on said shafts holding the same with said shoes held yieldably in said channels, and an expansion element in said mounting, bearing against the ends of said shafts, and operating against the force of said springs.

3. In a lapping machine, a spindle mounted therein for rotation and movement longitudinally, a head fixed to said spindle comprising an outer circular wall provided in its rim with spaces for stone holding tools and a central cylindrical mounting, a plurality of supports held rotatably and slidably in said wall and mounting and extending into the mounting, stone holding tools fixed to the outer ends of said supports, and normally occupying said spaces, stones carried by said tools, said tools being capable of being rotatably shifted in position upon being withdrawn from said spaces, springs connected with said supports, and holding the same with said stone holding tools held yieldably in said spaces, an expansion element in said mounting, engaging the ends of said supports, and means for adjustment of said expansion element to move said stones outwardly against the force of said springs.

4. In a lapping machine, a spindle mounted therein for rotation and reciprocation, a head fixed to said spindle and provided in its rim with stone holding spaces and having a central cavity, supports extending outwardly from said central cavity to said spaces, stone holding tools fixed to the outer ends of said supports, stones carried by said tools, springs on said supports holding the same yieldably in inward positions, an expansion element in said cavity in engagement with the inner ends of said supports, a plate supported on said spindle and provided with means for slidable connection with a fixture, adjustment devices on said plate, and means for imparting the movement of said adjustment devices to said expansion element to move said supports outwardly against the tension of said springs.

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