C. D. BUCK.

GRINDING MACHINE.

APPLICATION FILED JUNE 28, 1920.

1,371,854.

Patented Mar. 15, 1921.

2 SHEETS—SHEET 1.

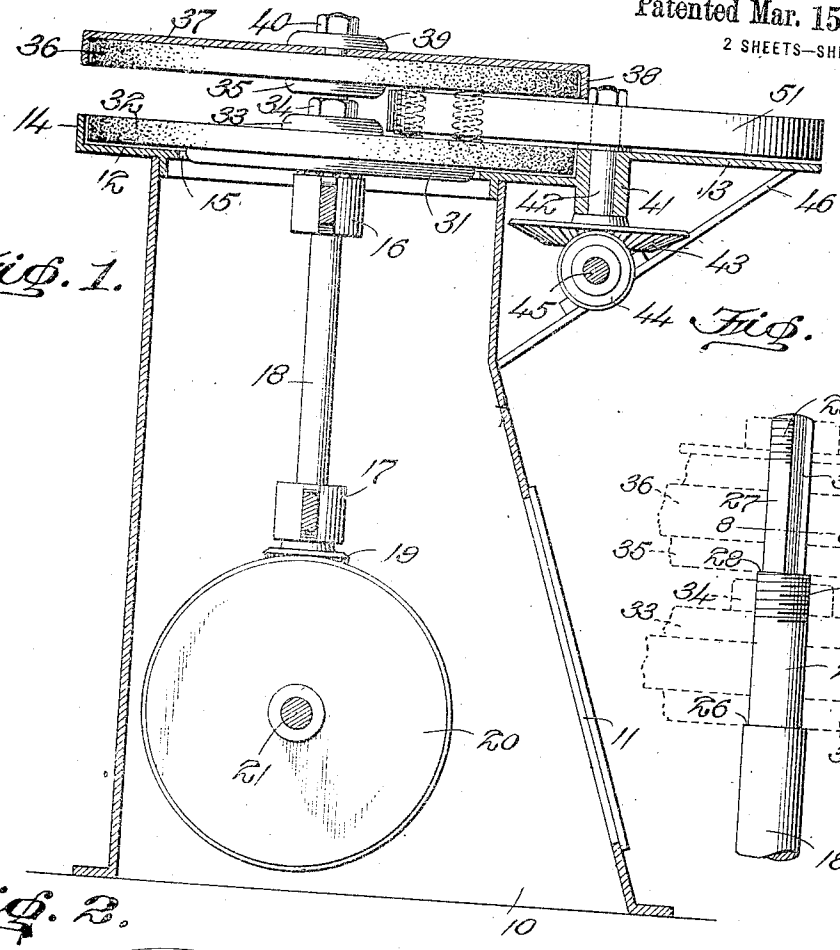


Fig. 1.

Fig. 7.

Fig. 2.

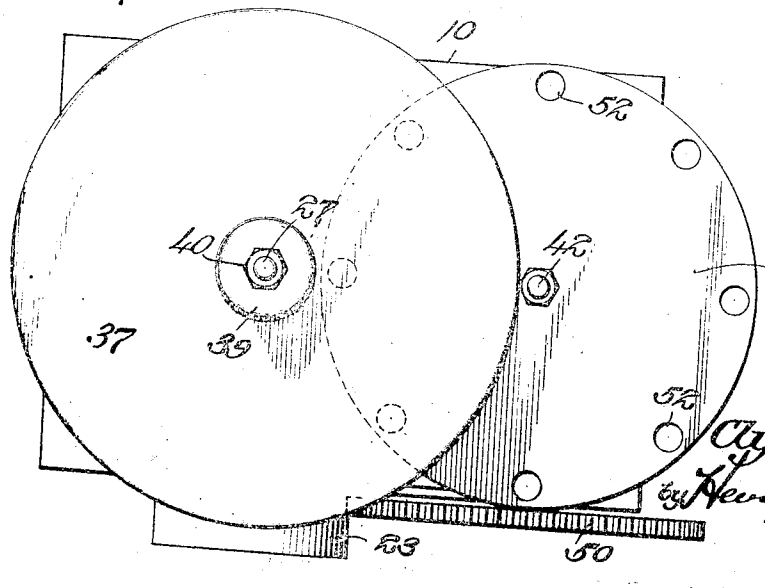
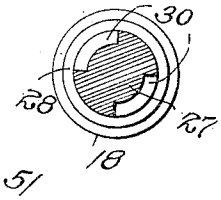


Fig. 8.



Inventor

Clyde D. Buck,

by Henry V. Wright

Attorney

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2 SHEETS—SHEET 2.

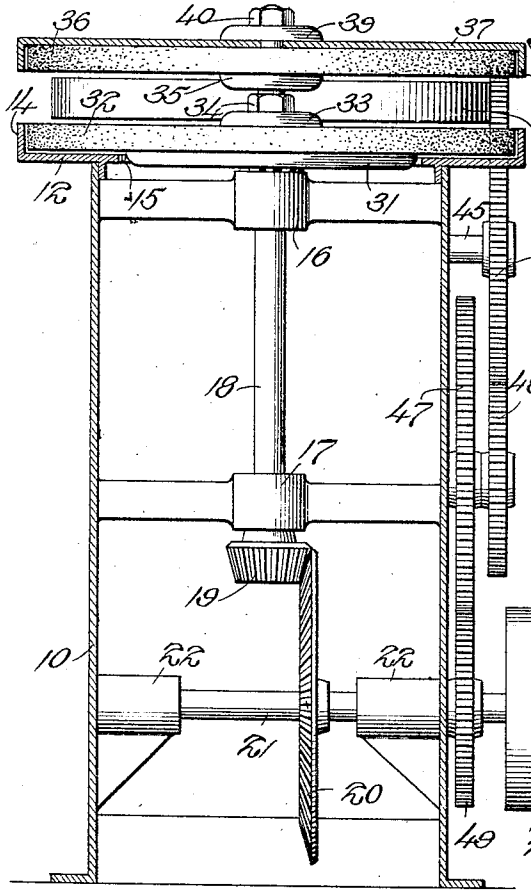


Fig. 3.

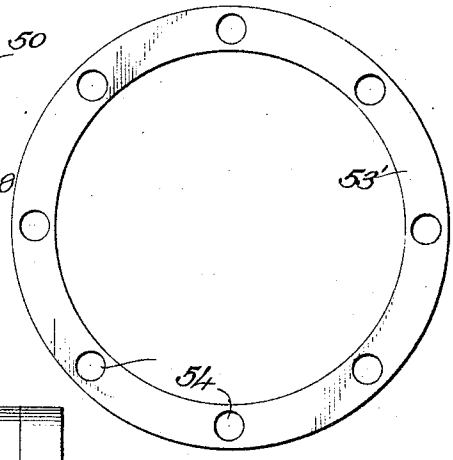


Fig. 5.

Fig. 4.

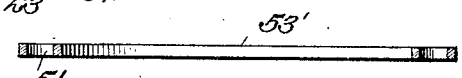
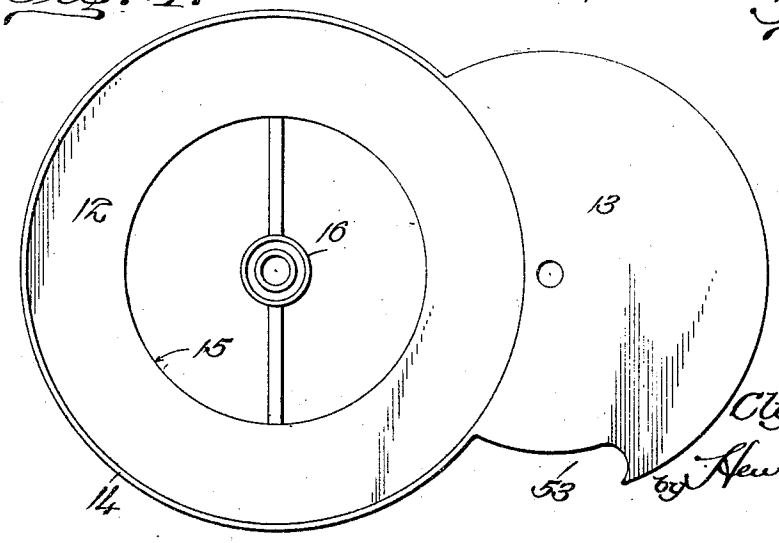


Fig. 6.



Inventor
Clyde D. Buck,
by Henry V. Brugh
Attorney

UNITED STATES PATENT OFFICE.

CLYDE D. BUCK, OF BATTLE CREEK, MICHIGAN.

GRINDING-MACHINE.

1,371,854. Specification of Letters Patent. Patented Mar. 15, 1921.

Application filed June 28, 1920. Serial No. 392,326.

To all whom it may concern:

Be it known that I, CLYDE D. BUCK, a citizen of the United States, and resident of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

My invention relates to grinding machines and has particular reference to improvements in machines designed especially for grinding to a flat surface the end portions of coiled compression springs.

The improvements contemplated in the present machine over similar types of existing machines consists in simplifying constructions and providing a more compact arrangement of parts; in providing means whereby the machine may be adapted for grinding springs of different lengths; in the provision of an arrangement eliminating the necessity of skill on the part of the operator in properly supplying springs to the machine to be ground; and in the provision of a simple arrangement to cause the springs after being ground and due entirely to natural influences to eject themselves from the machine.

I am disclosing my invention in the best form known to me at present. It is, however, susceptible to various modifications and desirable additions within the spirit and scope of what I have produced as new as particularly defined in the appended claims.

In the drawings forming a part of my disclosure:—

Figure 1 is a longitudinal section through a machine constructed in accordance with my invention;

Fig. 2, a top plan view;

Fig. 3, a transverse section;

Fig. 4, a top plan of the base with the operating parts removed;

Fig. 5, a plan view of a ring used in conjunction with the feed dial of my machine when it is desired to grind springs of greater length than can be efficiently accommodated by the feed dial alone;

Fig. 6, a section of the ring;

Fig. 7, an enlarged side view of the upper end of the drive shaft for the grind wheels; and

Fig. 8, a section on the line 8—8 of Fig. 7.

Referring now to the drawings in detail, it will be observed that my improved machine comprises a base 10 in the form of a substantially rectangular housing, preferably square and open at its upper end and of greater length than width at its bottom to enhance its stability and provided in one wall with a door 11 whereby access may be had to its interior.

Associated with the base 10 is a top including the integrally formed sections 12 and 13. Section 12 is of circular shape and provided with an upstanding peripheral flange 14, while section 13 is in the shape of a crescent, its upper surface being flat and flush with the upper edge of flange 14. The disk-like portion of section 12 is thus disposed below the plane of section 13 and said disk-like portion is provided with a relatively large central circular opening 15.

Within the base, in relative vertical spaced relation, are bearings 16 and 17 for a vertical shaft 18 which, at its lower end, carries a small bevel gear 19 with which meshes a relatively larger bevel gear 20 on a horizontal shaft 21 journaled in bearings 22 formed on opposite walls of the base. One end of shaft 21 extends exteriorly of the base and is provided with fixed and loose pulleys 23 and 24, respectively, whereby a drive belt from any suitable source of power may be shifted from one to the other to start or stop operation of the machine.

As best illustrated in Fig. 7 the upper end of shaft 18 is reduced in diameter throughout a suitable portion of its length, as at 25, to provide a shoulder 26 and said reduced portion 25 is again reduced in diameter, as at 27, to provide a second shoulder 28 above said first shoulder. Both the reduced portions 25 and 27 are screw threaded at their upper ends as at 29, and as best illustrated in the section, Fig. 8, the portion 27 is provided, throughout its length with oppositely disposed channels or recesses 30.

A disk 31 is secured in any suitable manner to the reduced portion 25 and rests on the shoulder 26, the opening 15 permitting this disk, which is relatively large in diameter, to be disposed with its upper flat surface slightly above the plane of the upper flat surface portion 12 of the top.

Mounted on the reduced portion 25 is a lower grind wheel 32 which seats on the disk 31. A second disk 33 engaging the upper surface of the grind wheel and a nut 34 engaging the threads 29 of portion 25 and

adapted to be screwed down against disk 33 serves to securely clamp the grind wheel between the disks and to the shaft as is obvious, the upstanding flange and the dish-like portion 12 of the top constituting a protective housing for all but the upper flat surface of the grind wheel as is also apparent.

Seated against the shoulder 28 is a disk 35 which preferably carries lugs for engagement with the recesses 30 whereby said disk is caused positively to rotate with the shaft, and seating on this disk is an upper grind wheel 36 in all respects a duplicate of the lower grind wheel. A shield 37 in the form of a circular plate rests on the upper flat surface of the grind wheel 36 and is provided with a downturned peripheral flange 38 which serves to protect the edge of said wheel. Seating against this shield is a disk 39 similar in all respects to the disk 35 while engaged with the threads 29 of the reduced portion 27 is a nut 40 which serves to clamp the shield and grind wheel firmly together and firmly between said disks 35 and 39.

Adjacent to the upstanding flange 14 the section 13 of the top is provided with a bearing 41 for a vertical shaft 42 which carries upon its lower end a bevel gear 43 which meshes with a relatively smaller bevel gear 44 on a horizontal shaft 45 journaled in suitable bearings carried by brace members 46 between the base 10 and the portion 13 of the top. A stub shaft is carried by one wall of the base and on this shaft are a pair of gears 47 and 48, the latter being considerably smaller than the former. Meshing with the gear 47 is a relatively smaller gear 49 on the horizontal shaft 21 and meshing with the gear 48 is a relatively larger gear 50 on the shaft 45. Rotation of the fixed pulley 23 therefore not only results in rotation of the vertical shaft 18 and grind wheels 32 and 36 through the gears 19 and 20, but also results in rotation of the vertical shaft 42 through the two bevel gears 43 and 44 and the train comprised by spur gears 47, 48, 49 and 50, the gearing being such that relatively high speed is imparted to the grind wheels and relatively low speed imparted to the vertical shaft 42.

Shaft 42 extends above the upper face of the top portion 13 and has fixed thereon a feed disk 51, a considerable portion of which projects between the vertically spaced upper and lower grind wheels, and said disk, as best illustrated in Fig. 2, is provided near its periphery with a series of openings 52 of any desired size and number.

To operate the machine the springs to be ground are simply dropped into exposed openings 52 of the disk 51 as said disk rotates, the disk carrying the springs around and between the grind wheels, which, also rotating, grind their ends to flat surfaces. It will be noted that the springs pass one by one between the grind wheels as the disk 51 rotates and that until they engage between the grind wheels they are supported and prevented from falling out of the openings 52 by the crescent shaped portion 13 of the top. This is important because the spring need only be dropped into the openings 52 which can be done without skill on the part of the operator.

By reference to Fig. 4 it will be observed that a marginal recess 53 is provided in the portion 13 of the top. Thus, as the disk 51 rotates and the openings 52 become alined with the recess the ground springs will fall successively through said recess and into a suitable receptacle provided to receive them.

If it is desired to grind springs of greater length than can be conveniently accommodated by the disk 51 the thickness of said disk may be increased by filler rings 53 as illustrated in Figs. 5 and 6, said rings being adapted to be secured to the feed disk in any desired manner with the series of openings 54 therein alined with the openings 52 in said feed disk. Any desired number of disks 35 may be provided and these will vary in thickness so that when a filler ring 53 is secured to the feed disk 51 a disk 35 of proper thickness is placed beneath the upper grind wheel so as to increase the space between the pair of grind wheels and position the lower face of said upper grind wheel properly with respect to the thickened feed disk. Relatively long springs may thus be supported throughout substantially their entire length during the operation of grinding their ends.

I claim:—

1. In a grinding machine, a base, a top for said base, a pair of spaced grind wheels, a feed disk having a portion thereof projecting between the grind wheels, said feed disk being provided with an opening to receive an article to be ground, and a portion of said top underlying said feed wheel and serving to support an article disposed in the opening of said feed wheel.

2. In a machine of the character described, a base, a top therefor, a grind wheel, a rotatable feed disk, a portion of the top being positioned to support an article carried by the feed disk, said top being provided with a recess located in the path of travel of an article carried by the feed disk.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CLYDE D. BUCK.

Witnesses:
C. J. Goodrich,
Edna M. Sorler