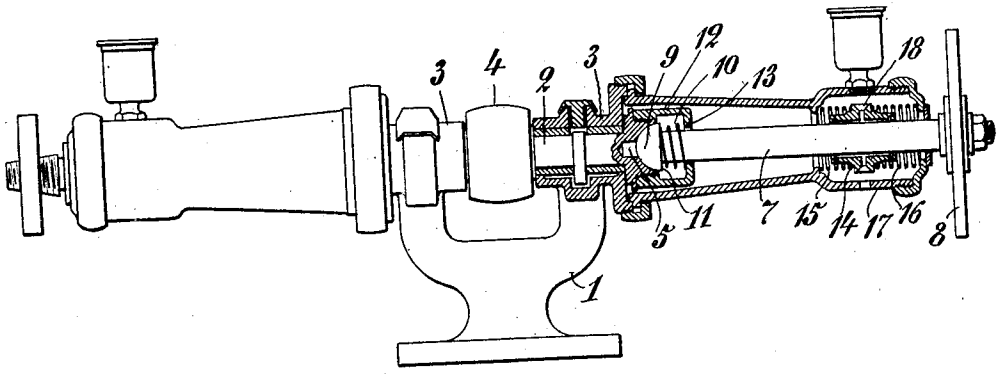
E. A. HANSEN.

GRINDING MACHINE.

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1,370,964.

Patented Mar. 8, 1921.



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GRINDING-MACHINE.

1,370,964. Specification of Letters Patent. Patented Mar. 8, 1921.

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To all whom it may concern:

Be it known that I, EIGIL AAGE HANSEN, a subject of the King of Denmark, residing at Frederiksberg, near Copenhagen, Denmark, have invented new and useful Improvements in Grinding-Machines, and I do hereby declare the following to be a full, clear, and exact description of the same.

All known grinding machines have the serious drawback that the grinding wheels generally rotating at a very high speed cannot be absolutely exactly balanced and will therefore get into more or less intense vibrations which cause the ground surface to be more or less corrugated. The incomplete balancing of the wheel has also the effect that the wheel is worn out of true which defect is rapidly increased and can give rise to bursting and thereby cause serious damage to life and property.

According to the present invention I avoid these drawbacks by mounting the shaft carrying the grinding wheel in such a manner that the wheel can yield and adjust itself and thus becomes self balancing. Another feature of the invention consists in the fact that in the connection element between the shaft of the grinding wheel and the power driven organ may be inserted a universal clutch or a similar organ which admits of a certain vibrating motion of the shaft and at the same time the said clutch can be constructed as a friction clutch which sets a limit for the torque which can be transmitted to the grinding wheel from the power driven element. The tendency to bursting is thereby much decreased and too heavy load or braking effect cannot be put on the grinding wheel without stopping its rotation.

An embodiment of the invention is shown in the annexed drawing partly in section. The frame of the machine is designated by 1 and the power driven shaft by 2. The latter is journaled in bearings 3 and carries a pulley 4. The free end 6 of the shaft 2 has a cavity 5 which is filled for instance with lubricating grease, and this end is screw threaded outside; the end-surface of the shaft 2 is formed as a part of a hollow sphere. The shaft 7 of the grinding wheel 8 carries a hemisphere 9, the spherical surface of which rests against the spherical surface in the end of the shaft 2, and the two spherical surfaces are pressed against one another by a helical spring 10, one end of which rests upon a shoulder 11, while the other end bears against an inner flange 13 on a cap or sleeve 12 screwed on the end of the driving shaft 2. Hereby is formed a friction clutch between the driven shaft 2 and the shaft 7 of the grinding wheel, and the pressure between the surfaces of the clutch is controlled by means of the screw cap 12 in such a manner that a maximum of the pressure and braking effect which may be exacted on the grinding wheel 8 mounted on the end of the shaft 7, is fixed and a greater pressure will cause the clutch to slip. The other bearing of the shaft 7 is a sleeve 14 springily mounted inside the bearing casing 17, in which it is carried by two springs 15 and 16 bearing against a shoulder 18 on the sleeve 14 and shoulders inside the casing 17 as shown. Hereby is provided a resilient support for the outer end of the shaft 7 allowing a certain vibration of the same.

As the shaft 7 passes through the casing 17 with a certain play, it will be seen that the shaft can yield to any pressure exerted on the grinding wheel 8. The wheel 8 mounted in the manner described is self-adjusting during its rotation and a perfectly smooth surface can be produced by a grinding machine of this character.

The same machine can be used for polishing and finishing certain articles if the grinding wheel be substituted by wheels of other material required by the nature of the work in question.

Besides the invention is especially well adapted for direct connection to electrical motors.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent:

1. A grinding machine comprising a driving shaft; a driven shaft normally in alinement with the driving shaft; a grinding wheel mounted on said driven shaft; means connecting one end of the driving shaft with the driven shaft whereby the latter is supported at one end by the former, said means causing said drive shaft to drive the driven shaft but permitting the latter to become disalined with relation to the former; and yieldingly mounted bearing in which the other end of the driven shaft is mounted to be yieldingly supported thereby, said bearings permitting the disalinement of said shafts when the shafts are rotated at high speed to allow the axis of rotation of the

grinding wheel to automatically coincide with the center of gravity thereof.

2. A grinding machine comprising a driving shaft, a driven shaft, a grinding wheel on the driven shaft, a yieldingly supported bearing in which the driven shaft is journaled, and a friction clutch between said shafts adapted to slip at a predetermined torque and permitting a slight disalinement of the driven shaft with relation to the driving shaft.

3. A grinding machine comprising a driving shaft; a driven shaft normally in alinement with the driving shaft; a grinding wheel on the driven shaft; a ball and socket joint between the driving shaft and the driven shaft whereby the former may become disalined with relation to the latter while maintaining a driving connection between the shafts; and a yieldingly mounted bearing in which the free end of the driven shaft is mounted.

In testimony whereof I have affixed my signature in presence of two witnesses.

EIGIL AAGE HANSEN.

Witnesses:
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K. YENSEN.