April 3, 1945. A. SPINA 2,372,688

CRYSTAL GRINDING DEVICE

Filed Jan. 20, 1944 2 Sheets-Sheet 1

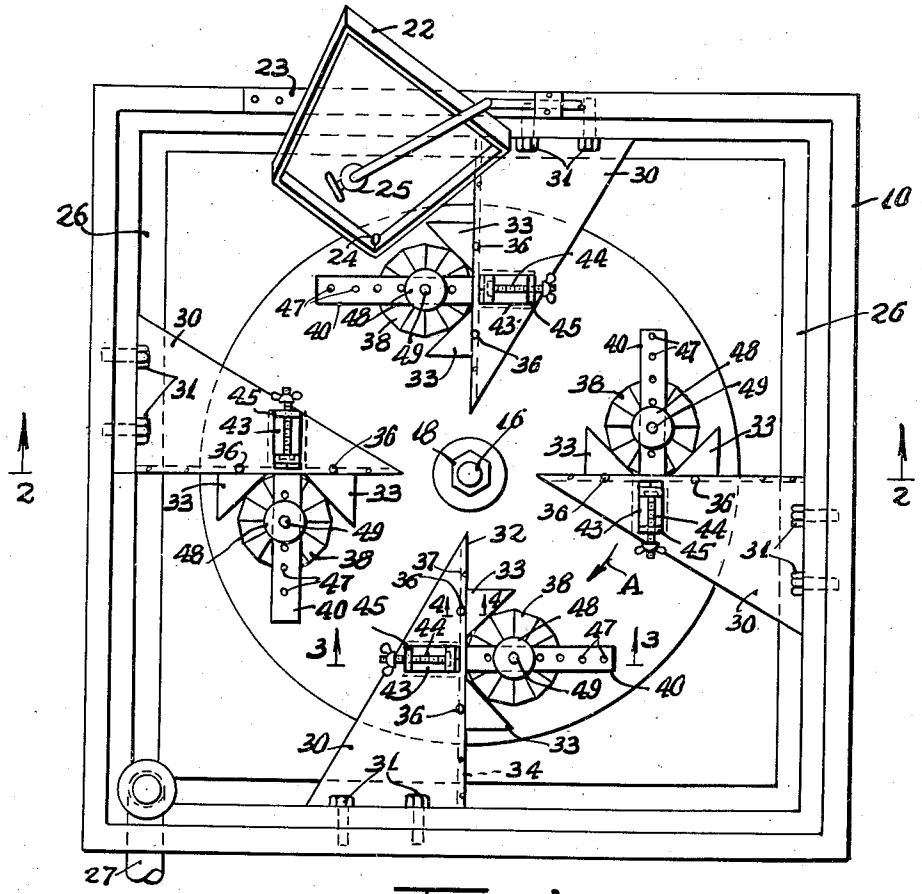


Fig. 1.

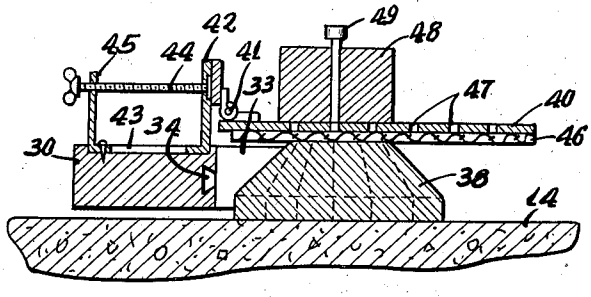


Fig. 3.

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CRYSTAL GRINDING DEVICE

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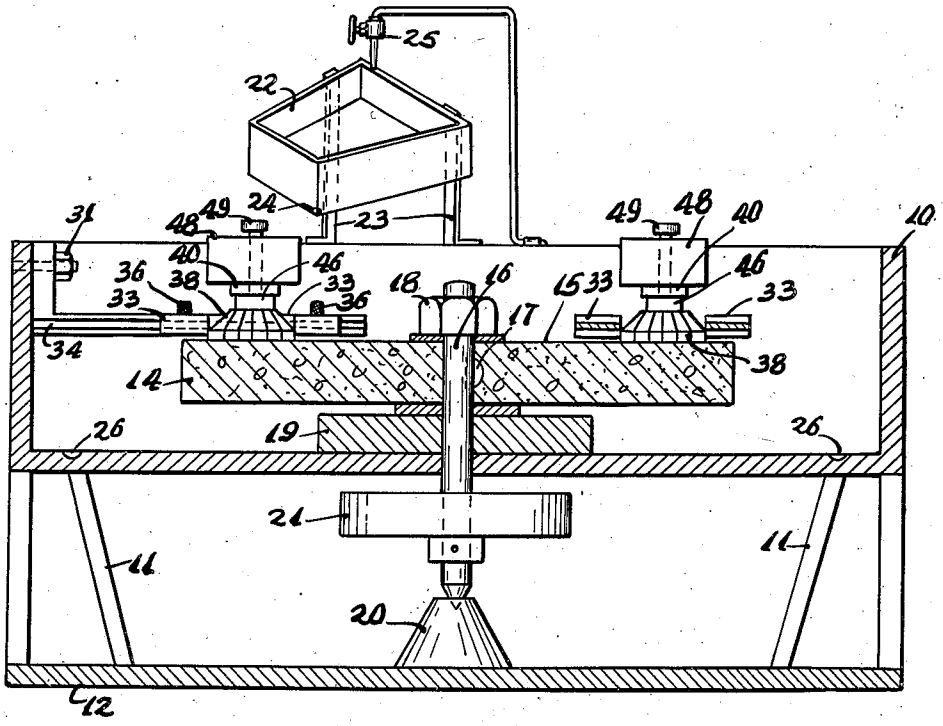


Fig. 2.

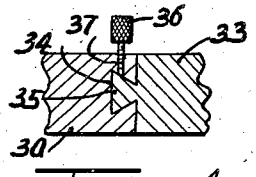


Fig. 4.

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UNITED STATES PATENT OFFICE

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CRYSTAL GRINDING DEVICE

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Application January 20, 1944, Serial No. 518,914

5 Claims. (Cl. 51—125)

This invention relates to new and useful improvements in machines for grinding crystals.

More particularly, the invention proposes an improved automatic crystal grinding machine characterized by a driven grinding or polishing wheel and means for holding and engaging crystals against said wheel in a certain way.

Still further the invention proposes means for supplying said grinding or polishing wheel with grinding or polishing fluid. A drain system is proposed for draining away the excess fluid.

It is proposed to characterize the means for holding the crystals by brackets extending over sections of said wheel and adjustably supporting and holding jaws for engaging and holding the crystals.

The invention also proposes the provision of arms hingedly mounted on said brackets and provided with adjustable weights for pressing said crystals against the grinding or polishing wheel.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a plan view of a crystal grinding machine constructed in accordance with this invention.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary enlarged vertical sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary enlarged vertical sectional view taken on the line 4—4 of Fig. 1.

The crystal grinding machine, according to this invention, includes a container 10 supported by legs 11 on a base 12. The container 10 is open at the top. A grinding or polishing wheel 14 is rotatively mounted within the container 10 and has a flat top 15. The wheel 14 is mounted upon a vertical shaft 16. It is secured to the shaft 16 by a key 17. A nut 18 threadedly engages on the top of the shaft 16. The shaft 16 is rotatively mounted through a bearing block 19 and is rotatively supported at the bottom upon a thrust bearing 20. A pulley 21 is mounted on the shaft 16 by which said shaft may be driven.

The grinding or polishing wheel 14 is supplied with grinding or polishing fluid in the nature Carborundum mud or other fluid. For this purpose there is a vessel 22 supported upon said container 10 by several brackets 23. This vessel 22 is supported at an inclination so that fluid supplied to it will drain off at the point 24 which is located above the grinding and polishing wheel 14. A water faucet water supply 25 discharges into the vessel 22. The vessel 22 may be filled with suitable grinding or polishing powders which may be turned into mud by the application of water from the faucet water supply 25. The container 10 is provided with draining grooves 26 upon its bottom and along its sides. These drain grooves 26 connect with a drain pipe 27 by which the excess fluid may be drained off.

The machine is also provided with a plurality of means for engaging and holding crystals 34 against said flat top 15. This means is in the nature of a plurality of brackets 30 removably mounted upon the walls of the vessel 10 by screws or other fastening elements 31. Each bracket 30 extends over a section of the wheel 14. Each bracket 30 has a radially extending side 32. A plurality of jaws 33 are adjustably mounted upon these radial sides 32. Each radial side 32 is formed with a dovetailed groove 34 into which dovetailed tongues 35 from the jaws 33 engage. Set screws 36 are threadedly mounted through certain of a group of threaded openings 37 for engaging against the tongues 35 for locking and holding the jaws 33, as desired. These jaws 33 are adapted to engage against the sides of a crystal 38 rested on the flat top 15.

Each bracket 30 is also provided with a substantially horizontal arm 40 which is connected by a hinge 41 with a slide 42. Each slide 42 is slidably mounted in tracks 43 located upon the top face of the bracket 30. A screw 44 rotatively engages each slide 32 and threadedly engages a fixed bracket 45 by which the slide 42 may be adjusted forwards and rearwards in various positions. Each arm 40 is provided with a felt strip 46 which is adapted to engage and rest upon the top of the crystal 38. Each arm 40 is formed with a plurality of spaced openings 47. A weight 48 is rested on each arm 40 and is provided with a pin 49 engageable in one of the openings 47 for holding the weight in selected positions upon the arm. The weight 48 is for the purpose of pressing the crystal 38 against the flat top 15 of the grinding or polishing wheel 14 at a desired pressure.

The operation of the device is as follows:

The wheel 14 is driven in the direction indicated by the arrow A in Fig. 1. When rotating in this direction the crystals 38 are urged against the brackets 30 and are held from moving lat-

erally by the jaws 33. The arms 40 may be adjusted so that the hinges 41 are located nearer or farther from the crystals 38 for increasing or decreasing the mechanical advantage of the arms 40 in relation to the crystals 38. The weights 48 may be placed in various positions on the arms 40 and in this way a proper pressure may be obtained between the crystals 38 and the flat surface 15 of the grinding or polishing wheel 14.

The grinding or polishing fluid drips upon the flat surface 15 of the grinding wheel 14 through the opening 24 of the vessel 22. The fluid collecting in the bottom of the vessel 10 will be drained away by the drain passages 26 and the drain pipe 27. The arms may be pivoted upwards to expose the crystals 38 which may be removed when desired.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. An automatic crystal grinding machine, comprising a container, a grinding or polishing wheel having a flat top and rotatively mounted in said container, means for driving said grinding wheel, means for supplying grinding or polishing fluid to the top of said wheel, means for draining said fluid from said container, and a plurality of means for engaging and holding crystals against said flat top, each of said latter named means comprising a bracket mounted on said container and extending over a section of said wheel and having one side extending radially of said wheel, a pair of jaws adjustably mounted on said radially extending side for engaging the sides of a crystal rested on said wheel, a substantially horizontal arm hingedly mounted on said bracket and extending over and engaging said crystal, and a weight on said arm for pressing said crystal against said wheel.

2. An automatic crystal grinding machine, comprising a container, a grinding or polishing wheel having a flat top and rotatively mounted in said container, means for driving said grinding wheel, means for supplying grinding or polishing fluid to the top of said wheel, means for draining said fluid from said container, and a plurality of means for engaging and holding crystals against said flat top, each of said latter named means comprising a bracket mounted on said container and extending over a section of said wheel and having one side extending radially of said wheel, a pair of jaws adjustably mounted on said radially extending side for engaging the sides of a crystal rested on said wheel, a substantially horizontal arm hingedly mounted on said bracket and extending over and engaging said crystal, and a weight on said arm for pressing said crystal against said wheel, said means for supplying said fluid including a vessel supported above the grinding or polishing wheel and having an opening through which Carborundum mud or other polishing material may drip upon said grinding wheel.

3. An automatic crystal grinding machine, comprising a container, a grinding or polishing wheel having a flat top and rotatively mounted in said container, means for driving said grinding wheel, means for supplying grinding or polishing fluid to the top of said wheel, means for draining said fluid from said container, and a plurality of means for engaging and holding crystals against said flat top, each of said latter named means comprising a bracket mounted on said container and extending over a section of said wheel and having one side extending radially of said wheel, a pair of jaws adjustably mounted on said radially extending side for engaging the sides of a crystal rested on said wheel, a substantially horizontal arm hingedly mounted on said bracket and extending over and engaging said crystal, and a weight on said arm for pressing said crystal against said wheel, said jaws having dovetailed tongues engaging dovetailed grooves formed upon the radial sides of said brackets.

4. An automatic crystal grinding machine, comprising a container, a grinding or polishing wheel having a flat top and rotatively mounted in said container, means for driving said grinding wheel, means for supplying grinding or polishing fluid to the top of said wheel, means for draining said fluid from said container, and a plurality of means for engaging and holding crystals against said flat top, each of said latter named means comprising a bracket mounted on said container and extending over a section of said wheel and having one side extending radially of said wheel, a pair of jaws adjustably mounted on said radially extending side for engaging the sides of a crystal rested on said wheel, a substantially horizontal arm hingedly mounted on said bracket and extending over and engaging said crystal, and a weight on said arm for pressing said crystal against said wheel, said jaws having dovetailed tongues engaging dovetailed grooves formed upon the radial sides of said brackets, and set screws threadedly engaging the brackets and abuttable against said tongues for holding the jaws in selected positions.

5. An automatic crystal grinding machine, comprising a container, a grinding or polishing wheel having a flat top and rotatively mounted in said container, means for driving said grinding wheel, means for supplying grinding or polishing fluid to the top of said wheel, means for draining said fluid from said container, and a plurality of means for engaging and holding crystals against said flat top, each of said latter named means comprising a bracket mounted on said container and extending over a section of said wheel and having one side extending radially of said wheel, a pair of jaws adjustably mounted on said radially extending side for engaging the sides of a crystal rested on said wheel, a substantially horizontal arm hingedly mounted on said bracket and extending over and engaging said crystal, and a weight on said arm for pressing said crystal against said wheel, slides mounted upon said brackets, adjustment screws for adjusting said slides, and said horizontal arms being hingedly connected with said slides.

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