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APPARATUS FOR THE RECOVERY OF DIAMOND POWDER OR BORT

Filed March 18, 1952

2 Sheets-Sheet 1

Fig. 1

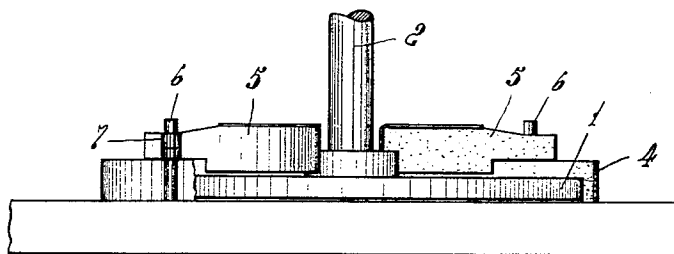
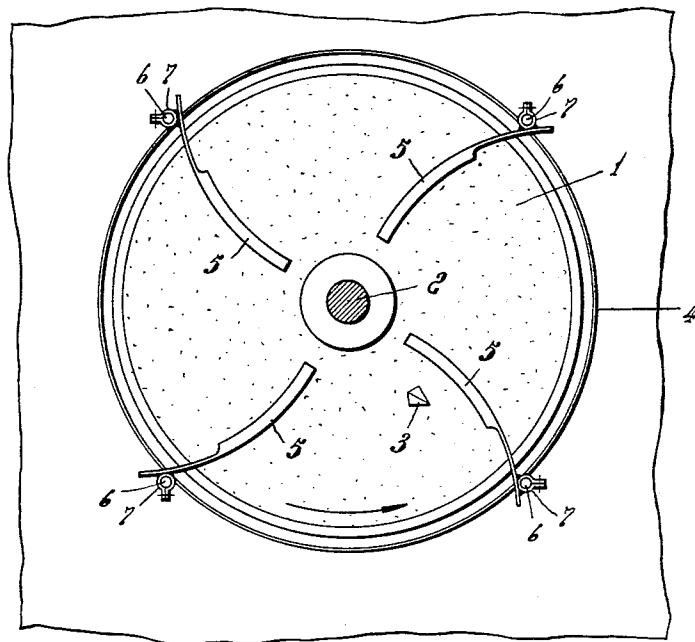


Fig. 2



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Fig. 3

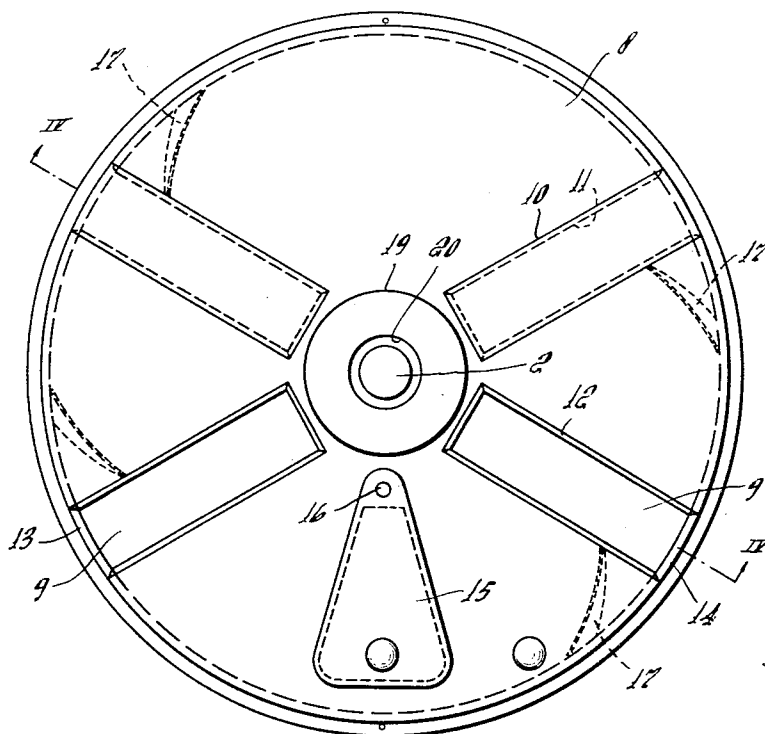
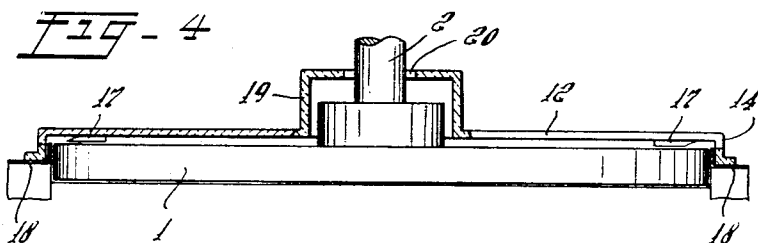


Fig. 4



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APPARATUS FOR THE RECOVERY OF DIAMOND POWDER OR BORT

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6 Claims. (Cl. 51—270)

This invention relates to a method and an apparatus for the recovery of diamond powder, the so-called bort. It is known to rub bort with a few drops of oil on a grinding wheel made e. g. of cast iron and to recover this bort at least partly during the grinding by means of an upstanding catch plate which surrounds the grinding wheel at its periphery and the upper side of which projects a little above the adjacent upper peripheral edge of the grinding wheel, and against which bort hurled off the grinding wheel will impinge. However, the grinding of the diamond or diamonds which grindings are not mixed with oil, will be lost because these are dry and will be suspended in the air. This loss is not inconsiderable and at an estimate it amounts to about 50% of the grindings of each diamond.

The invention has for its object to improve this uneconomical state of things.

To that end the bort formed during the grinding of one or more diamonds on the grinding wheel, which bort is suspended in the air, is collected either by sucking it to a collecting place, or by catching it by means of one or more catching faces which are arranged in the path of movement of the diamond powder or bort which is produced during the grinding of the diamond and which is partly suspended in the air; when these catching faces are made e. g. of metal they can be covered at the catching side with an adhesive substance, e. g. one of the known fats to which bort will adhere; if the catching faces are made of a material which has an electrostatic charge or to which such a charge has been given e. g. by friction, the covering of the catching side with an adhesive substance is not necessary; an example of a material that can be used without an adhesive substance is plastic.

Practical experience has shown that by applying the above method according to the invention a recovery of about 30% of diamond powder or bort can be reached.

According to the invention it is possible to arrange at a slight distance above the grinding wheel one or more catching screens distributed over the upper side of the grinding wheel, one side of which—if they are made from metal, at least not from plastic or another material having or capable of taking an electrostatic charge—is covered with a sticky substance to which bort can adhere.

This catching side of the catching screens will then be turned towards the side from which the suspended diamond dust is supplied during the grinding.

These catching screens can be constructed as curved blades, the lower longitudinal edges of which are slightly spaced from the upper side of the grinding wheel and which, if desired, may be adjustable in such a manner that said space and/or the radial position is/are adjustable; the blades may be mounted on the catching plate and/or detached therefrom on supports.

For applying the above method according to the invention it is also possible to use an apparatus consisting of a transparent cap either covered internally with a transparent adhesive capable of retaining bort or made

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of plastic or another transparent material having or capable of taking an electrostatic charge without a covering of adhesive, which cap can be arranged over a grinding wheel and which is provided with one or more recesses that admit of being covered; these recesses serve for the passage of the diamond holding means. They can extend in radial direction and admit of being closed by means of a removable e. g. plastic cover.

According to the invention the cap can carry one or more catching screens or blades fixed to the inside thereof, which screens or blades when made e. g. of metal are again covered with an adhesive at the catching side and when made of plastic do not require to be covered with an adhesive.

The lower side of these screens or blades is closely adjacent the upper side of the grinding wheel when the cap is arranged over the grinding wheel; while the cap admits of having the upstanding shaft of the grinding wheel passed therethrough.

The drawings illustrate the invention by means of an embodiment of the apparatus.

Fig. 1 is a side view of this apparatus and

Fig. 2 is a plan view thereof;

Fig. 3 is a plan view of a transparent plastic cap arranged over the grinding wheel and

Fig. 4 is a vertical section on the line IV—IV in Fig. 3.

The reference numeral 1 designates a grinding wheel mounted on a central shaft 2 and adapted to be rotated by means of said shaft. The grinding wheel is intended for the grinding of four diamonds at four different places on the wheel. The reference numeral 3 designates a diamond to be ground at one place, the means for holding the diamond that are known per se being not shown.

The grinding wheel has its periphery surrounded by an upstanding e. g. metal catch plate 4, the upper side of which slightly protrudes above the peripheral edge of the grinding wheel. This catch plate mainly serves for recovering the bort applied to the grinding wheel which is hurled against the inner side of the catch plate and because this inner side is covered with a substance to which bort will adhere, the bort is thus recovered.

On the catch plate 4 catching blades 5 e. g. of metal are mounted in four places uniformly distributed over the circumference of the grinding wheel, which blades are mainly directed radially and which are arcuate. At the concave side these blades are covered with a sticky substance to which bort will adhere. The blades are mounted by means of vertical pins 6 and clips 7 which clips are secured to the outer end of the blade and which can be clamped on the pins. The vertical position of the blades or in other words the spaces between the lower edge of the blades and the upper side of the grinding wheel, and the angular position of the blades can be adjusted therefore. The lower edges of the blades follows the configuration of the upper side of the grinding wheel.

According to Figures 3 and 4 a transparent plastic cap 8 is arranged over the grinding wheel 1 with its vertical driving shaft 2, which cap rests on a table 18. In the centre the cap has a raised portion 19 comprising a central opening 20 for the shaft 2. Also in this case the grinding wheel is surrounded by an upstanding catch plate.

The cap 8 is provided with four oblong rectangular recesses 9 through which the diamond holding means can pass. Each of these recesses can be closed by means of a detachable plastic cover. These covers will then have their bevelled edges 11 bearing on correspondingly bevelled edges 12 of the recesses. At 13 and 14 the covers have been removed. The numeral 15 designates a cover made e. g. of plastic which is mounted so as to be pivotable at 16.

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It can be pivoted to the left or to the right on the pivot 16 to open the cap for inspection. The cap 8 carries plastic catching screens or blades 17, the lower side of which is located closely above the upper side of the grinding wheel 1.

I claim:

1. In apparatus for grinding diamonds including a horizontal grinding wheel, a catching rim surrounding said grinding wheel at its periphery and having its upper edge protruding above the adjacent upper peripheral edge of the grinding wheel, the side of the catching rim facing the center of said grinding wheel being covered with an adhesive, bort-retaining substance, and at least one bort-catching and retaining baffle means disposed over the upper surface of said grinding wheel, the face of said baffle means opposed to the direction of rotation of said wheel being covered with an adhesive, bort-retaining substance.

2. Apparatus as defined in claim 1, wherein each bort-catching and retaining baffle means has the form of an arcuate blade having a lower longitudinal edge parallel to the upper surface of said grinding wheel.

3. Apparatus as defined in claim 1, wherein means are provided for adjusting said baffle means in a direction perpendicular to the surface of said grinding wheel and in a direction parallel to the surface of said grinding wheel.

4. In apparatus for grinding diamonds including a horizontal grinding wheel, a catching rim surrounding said grinding wheel at its periphery, a transparent hood disposed over said grinding wheel and having a peripheral rim portion resting on said catching rim, said hood being provided with at least one aperture for receiving diamond-holding means, and at least one bort-catching and retaining baffle means disposed under said hood and over the upper surface of said grinding wheel and extending in a

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generally radial direction, the face of said baffle means opposite to the direction of rotation of the wheel and inner faces of said hood and catching rim all having bort-retaining surfaces to which bort striking said surfaces adheres.

5. In apparatus for grinding diamonds including a horizontal grinding wheel, a transparent hood disposed over said grinding wheel and having a downwardly extending rim portion surrounding said grinding wheel, and means for supporting the hood, said hood being provided with at least one aperture for receiving diamond-holding means, and at least one bort-catching and retaining baffle means disposed under said hood and over the upper surface of said grinding wheel and extending in a generally radial direction, the face of said baffle means opposite to the direction of rotation of the wheel and inner faces of said hood including said rim all having bort-retaining surfaces to which bort striking said surfaces adheres.

6. Apparatus according to claim 5, in which said baffle means is carried by said hood and extends inwardly from the rim of said hood.

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