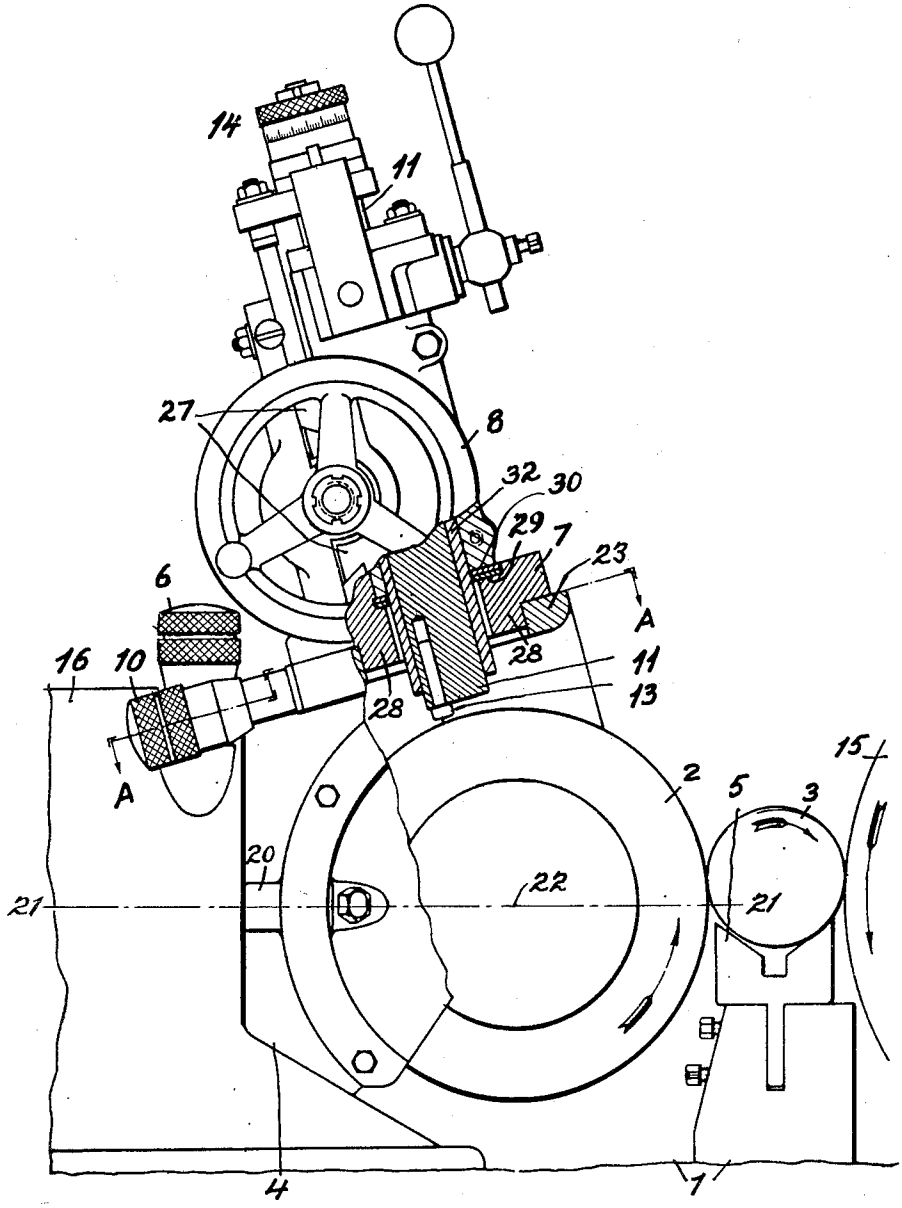
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ARRANGEMENT AT CENTERLESS GRINDING MACHINES

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Fig. 1.



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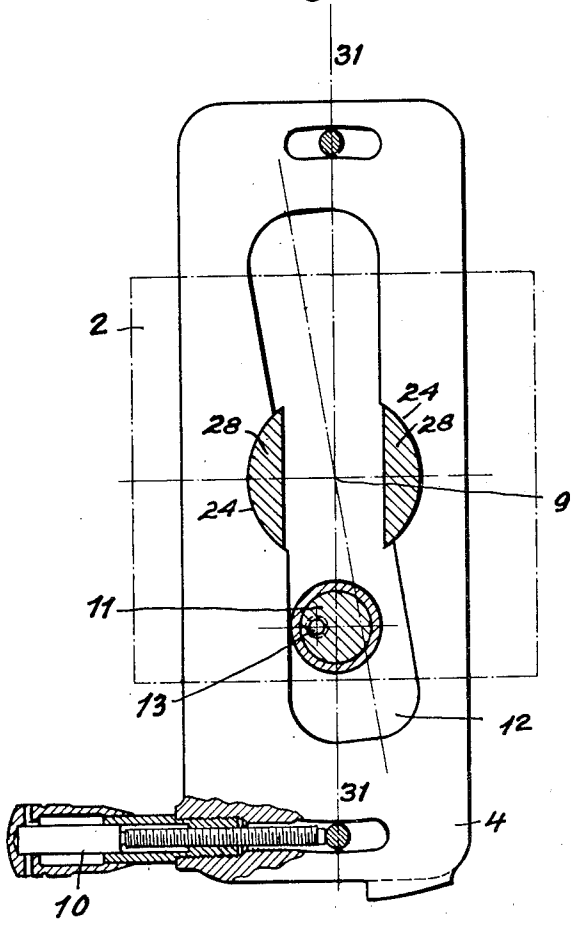
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Fig.2.



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ARRANGEMENT AT CENTERLESS GRINDING MACHINES

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1 Claim. (Cl. 125—11)

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The present invention relates to improvements in centreless grinding machines.

The object of the invention is to effect a perfect (or practically complete) contact between the obliquely placed pressing roller and the work piece.

More specifically, the object of the invention is the arrangement of the tool holder in the dressing apparatus in a way that the dressing point of the diamond may be conveniently adjusted to vary the amount of its offset when the axis of the pressing wheel is inclined relatively to the axis of the grinding wheel. The dressing diamond may thus be adjustably positioned at such a distance from a line passing through the centre of the diamond holder and parallel to the moving direction of the dressing slide, that the generatrix of the working surface of the pressing roller resulting from the dressing will be given the curved shape required for attaining the perfect contact.

The invention relates to grinding machines in which the dressing slide as well as the pressing roller are adjustable independently of each other, in the embodiment hereinafter more specifically described, by means of micrometrical screws for the purpose of attaining the desired exact curve shape of the generatrix of the working surface of the pressing roller in connection with the setting of the diamond.

The invention will be described more in detail in connection with the embodiment illustrated on the accompanying drawings.

Fig. 1 illustrates a side view, partly in sectional elevation of the pressing roller, the dressing slide and the dressing diamond and the adjusting means of the pressing roller as well as of the dressing slide, while Fig. 2 is a section taken on the line A—A of Fig. 1.

On the accompanying drawings 1 designates the machine stand on which the grinding disc 15 and the bearing device of the disc (not shown) are placed and made in a manner known per se. The machine bed 1 also carries the pressing wheel carriage 16 slidable thereon in a direction across the center axes of the pressing wheel 2, the work 3, and the grinding wheel 15. On the carriage 16 there is journalled the pressing carrier 4 tiltable about a pivot 20 about an axis 21—21 in the said direction and through the center 22 of the pressing wheel 2. The pressing wheel 2 is journalled in the conventional way on the pressing wheel carrier 4.

Through proper tilting of the pressing wheel carrier 4 about its pivot 20 the axis of the pressing wheel can be given the desired declination in relation to the grinding disc 15 and thereby also to the axis of the work piece placed on the support guide 5. For attaining an exact declination of the pressing roller 2 a micrometrical setting device 6 is provided by means of which the pressing wheel carrier 4 may be tilted about its pivot 20 and set at a desired angle relatively to the work piece 3.

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The pressing wheel carrier 4 has at its top and rigid therewith a supporting plate 23 shaped with a seating recess 24 and a longitudinal slot 12 traversing the seating recess. The supporting plate 23 supports above the dressing wheel 2 the dressing apparatus comprising a base portion 7, a bracket 27, and a dressing tool holder 11.

The base portion comprises downwardly projecting trunnion segments 28 adapted to be seated and rotated on the seating recess 24. The base portion is further provided with a guideway 29 on which a slide 30 provided at the underside of the bracket 27 may be displaced, by means of a hand wheel 8, generally parallel to the direction of the axes of the pressing wheel and grinding wheel, in the position shown in Fig. 2, along axis 31—31.

In addition to this longitudinal displacement, the base portion 7 with the bracket and tool holder thereon is furthermore adapted to be swung by means of its trunnion segment seat about the center axis 9 of this seat by aid of another micrometrical setting device 10 in such a manner that the longitudinal axis of the dressing slide 30 can be set accurately at the desired angle in relation to the shaft of the pressing roller 2.

In the bracket 27 there is further vertically arranged a rotatable and longitudinally movable diamond holder 11 within a sleeve 32 of bracket 27 and protruding through slot 12 in the supporting plate 4. The dressing diamond 13 at the lower end of the diamond holder 11 is secured to the holder at a point radially spaced from the axis of the tool holder and thus is eccentrically arranged in relation to the centre of same in such a manner that the diamond 13 by the rotation of the diamond holder 11 can be set at a variable distance from a line passing through the centre of the diamond holder and parallel to the longitudinal moving direction of the dressing slide 30. The raising or lowering respectively of the diamond holder 11 and thereby of the diamond 13 is effected by means of a micrometrical screw 14, while the rotation of the diamond holder 11 may be obtained by the use of a special diamond setting tool (not shown).

Presuming that a cylindrical work piece having a diameter of for instance 50 mm. has to be ground, the setting of the machine for the work piece in question is made in the following manner.

Firstly a gauge corresponding to the finished work piece is placed on the support guide 5 whereafter the support guide is set as to elevation in a manner known per se, so that the axis of the gauge will be located above or below a plane passing through the shaft of the grinding disc 15 and the shaft of the pressing roller 2 when these shafts are parallel. Thereafter, the shaft of the pressing roller 2 is obliquely placed a certain angle to the above mentioned plane, said angle in conjunction with the diameter and the rotation speed of the pressing roller 2 determining the peripheral speed of the work piece. This angular setting is effected by aid of the micrometrical setting device 6 and will probably amount to a declination angle of about 2 to 3°.

Secondly, the dressing slide 30 is set at a certain angle in relation to the shaft of the pressing roller 2 by aid of the other micrometrical setting device 10, which angle at the chosen example according to the invention is somewhat smaller than the declination angle of the pressing roller 2. Thereafter by turning of the diamond holder 11 the dressing diamond 13 is set at a certain distance from a line passing through the centre of the diamond holder and parallelly to the moving direction of the dressing slide 30. This distance should at the chosen example amount to about 8 mm. in the case that the centre height of the work piece above and below respectively of the above mentioned plane through the shafts of the grinding disc and of the pressing roller amounts to for instance 9.5 mm. The now indicated setting values of the chosen work piece are obtained by following a table appertaining to the machine.

After the above mentioned settings the dressing of the pressing roller takes place by means of the diamond in a manner known per se, whereby the generatrix of the working surface of the pressing roller 2 obtains just the hyperbola shape that assures the perfect (or practically complete) contact between the obliquely set pressing roller and the work piece.

However, it is evident that if a work piece having another diameter has to be ground later on a new setting and dressing takes place according to the above mentioned setting table.

The invention is of course not limited to the embodiment illustrated and described but can be

varied in many different ways within the scope of the invention.

Having now particularly described the nature of my invention and the manner of its operation what I claim is:

Apparatus for dressing the peripheral surface of the pressing wheel of a centerless grinding machine of the type wherein the machine bed carries the pressing wheel carriage slidable thereon in a direction across the center of the pressing wheel, the work and the grinding wheel, and the pressing wheel carrier is journalled on said carriage tiltable about an axis in the said direction and through the center of said pressing wheel and said pressing wheel carrier has a supporting plate rigid therewith for mounting thereon said dressing apparatus; a seating recess and a longitudinal slot being shaped in said supporting plate, said dressing apparatus comprising a base portion, a bracket, and a dressing tool holder, said slot traversing said seating recess, said base portion comprising downwardly projecting trunnion segments adapted to be seated and rotated on said seating recess, a guideway disposed on said trunnion segments, said bracket having a slide disposed at its underside and associated with said guideway so as to be slidable thereon generally parallel to the direction of said axes, setting means associated with said supporting plate and said base portion for angularly displacing, about said seating recess and relatively to said supporting plate, said base portion with said bracket thereon; said bracket having a bore, a sleeve disposed in said bore and said tool holder in said sleeve; said tool holder being adapted thereby to be displaced lengthwise and rotationally in said bracket, said tool holder having means for securing the dressing diamond at said holder at a point radially spaced from the axis of said tool holder; thereby, by displacement of said tool holder lengthwise of said bracket to extend said tool holder through said slot and bring said diamond into contact with said peripheral surface and by rotation of said tool holder in said bracket to vary the amount of offset of the dressing point.

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