June 5, 1956 L. W. PARDEE 2,748,543

ADJUSTABLE BLADE POSITIONING AND GUIDING ATTACHMENT FOR GRINDING WHEELS

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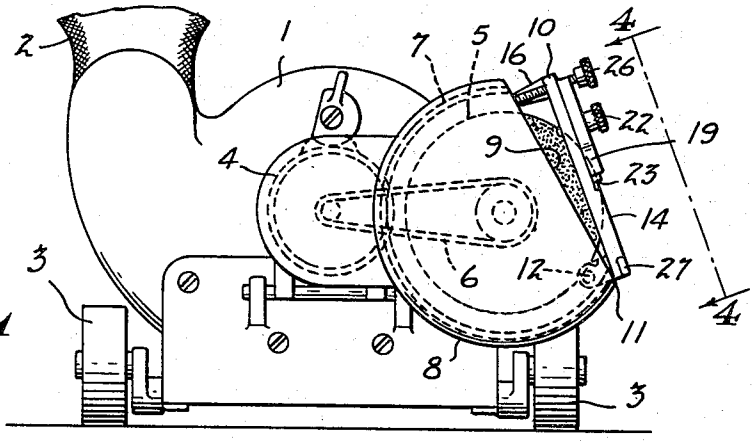


Fig. 1

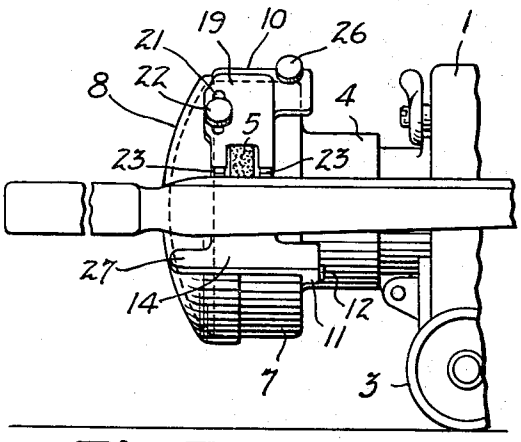


Fig. 2

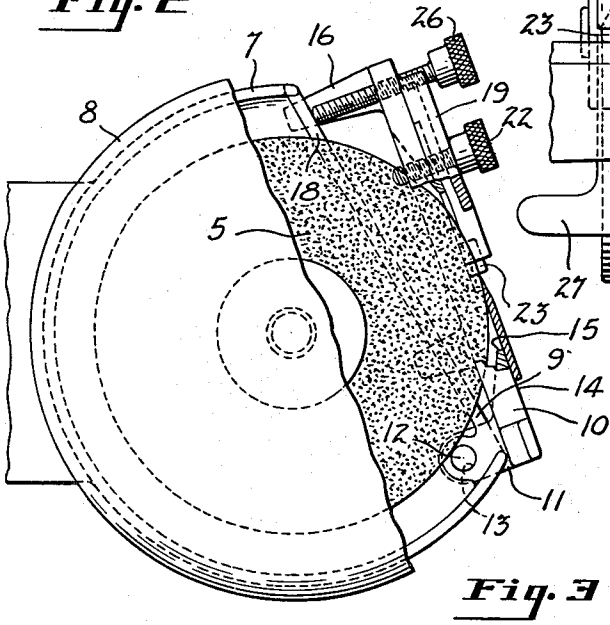


Fig. 3

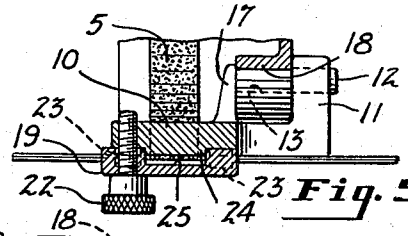


Fig. 5

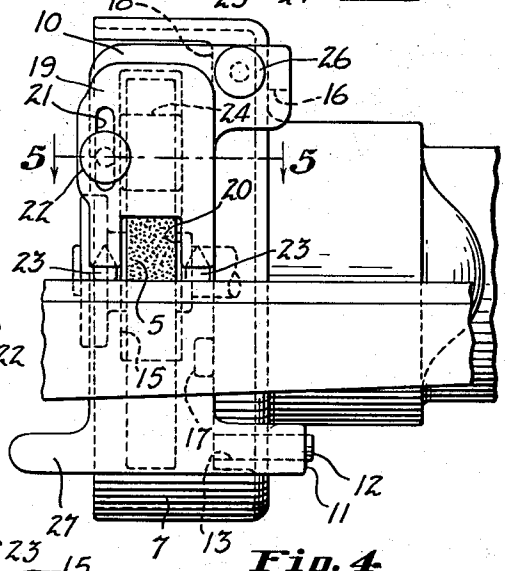


Fig. 4

INVENTOR

Lloyd W. Pardee

BY Evans & McCoy

ATTORNEYS

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ADJUSTABLE BLADE POSITIONING AND GUIDING ATTACHMENT FOR GRINDING WHEELS

Lloyd W. Pardee, Lakewood, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio, a corporation of Ohio

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10 Claims. (Cl. 51—102)

This invention relates to an adjustable blade positioning and guiding attachment for grinding wheels by means of which a uniform cutting edge of the desired depth and desired angle of bevel may be ground.

The device of the present invention is an attachment adapted to be mounted in fixed positions with respect to a grinding wheel and designed to support a blade to be sharpened for engagement with the periphery of a grinding wheel, the attachment having a flat blade supporting bed that is provided with an elongated slot through which the portion of the periphery of the grinding wheel with which the blade is to engage projects. The attachment is mounted for adjustment toward and away from the grinding wheel axis to increase or decrease the arc of the grinding wheel that projects past the plane of the blade supporting bed. A blade guide is mounted on the bed and has blade engaging portions alined transversely of the wheel receiving slot for positioning the blade with respect to the wheel periphery, the guide member being adjustable longitudinally of the wheel receiving slot. By adjusting the attachment toward and away from the axis of the grinding wheel the angle of the grinding wheel periphery to the plane of the bed at the point where the periphery of the grinding wheel intersects the plane of the bed is varied to vary the angle of bevel that is ground on the blade by the grinding wheel. The adjustment of the guide member varies the depth of the bevel that is formed by the grinding wheel on the edge of the blade. The grinding wheel is preferably mounted in the housing that encloses the major portion of the wheel and that is connected to a suction creating device to carry away the particles of metal and abrasive material resulting from the grinding operation.

The invention has for its object to provide a simple and convenient grinding wheel attachment by means of which a uniform cutting edge of the desired depth and of the desired angle of bevel can be quickly and easily ground.

Reference should be had to the accompanying drawings forming a part of this specification in which:

Figure 1 is a side elevation showing the grinding wheel attachment applied to a grinding wheel that is detachably mounted uppon the fan housing of a household vacuum cleaner and driven by the vacuum cleaner fan shaft;

Fig. 2 is a front elevation of the blade positioning and grinding attachment;

Fig. 3 is a side elevation of the grinding wheel attachment on a larger scale than in Fig. 1;

Fig. 4 is a plan view of the blade positioning and guiding attachment viewed as indicated by the arrows 4—4 in Fig. 1; and

Fig. 5 is a horizontal section taken on the line indicated at 5—5 in Fig. 4.

In the accompanying drawings the attachment of the present invention is shown applied to a grinding wheel mounted on a vacuum cleaner in a detachable housing

that replaces the suction nozzle as shown in the patent to MacFarland et al. 2,563,541, August 21, 1951.

The vacuum cleaner to which the attachment is applied has a fan housing 1, a dust collector 2 and supporting wheels 3. A detachable housing 4 replaces the suction nozzle of the cleaner and supports a grinding wheel 5 that is driven from the fan shaft by a belt 6 and that is enclosed in a hood or housing 7. The housing 7 has a detachable cap 8 which forms the front wall of the housing 7 and the housing 7 is provided with an opening 9 that extends downwardly and laterally at an inclination from the top of the housing 7, the opening 9 exposing a portion of the periphery of the grinding wheel 5. A blade positioning and guiding attachment 10 overlies the opening 9 and has an inwardly projecting lug 11 at its lower end which carries a pin 12 that fits in a bearing socket 13 formed in the housing 7. The common axis of the pin 12 and its bearing socket 13 is parallel to the axis of the wheel 5 and the attachment 10 swings about the pivot 12 into and out of a position overlying the opening 9. The outer face of the attachment 10 is formed to provide a flat bed 14 for supporting a blade in position to engage with the periphery of the grinding wheel 5, the bed 14 having an elongated slot 15 to receive a peripheral portion of the grinding wheel.

The attachment 10 has inwardly projecting lugs 16 and 17 which engage opposite sides of the inner wall of the housing 7 to hold the attachment against lateral movements with respect to the housing when the attachment is swung to a position overlying the opening 9. The upper lug 16 is positioned to engage with the exterior of the inner wall of the housing 7 and the lower lug 17 is inwardly offset with respect to the lug 16 and engages with the edge of an inturned flange 18 on the housing wall.

A guide member 19 is mounted on the bed 14 and has a slot 20 at the lower end thereof that registers with the slot 15 of the bed. The guide member 19 is adjustable longitudinally of the slot 15 and is provided with an elongated slot 21 that extends longitudinally thereof and that receives a clamping screw 22 that passes through the slot and that is screwed into the attachment 10 beneath the guide member 19. The guide member 19 has laterally alined blade engaging portions 23 that are positioned on opposite sides of the slot 20 and that are alined at right angles to the slot 20. In order to maintain the guide member 19 in alinement with the slot 20, the attachment 10 is provided with a raised rib 24 that is alined longitudinally with the slot 20 and that fits in a guide groove 25 in the bottom face of the guide member 19.

The attachment is adjustably positioned with respect to the grinding wheel axis by means of an adjustable stop member in the form of a screw 26 that is threaded in the attachment 10 and that is engageable with the housing flange 18 to support the attachment at the desired distance from the axis of the grinding wheel. By adjusting the screw 26 fine adjustments of the bed 12 toward or away from the axis of the grinding wheel may be made to accurately position the grinding wheel with respect to the plane of the bed 14.

The adjustment of the bed 14 with respect to the axis of the grinding wheel determines the angle of the bevel that is ground by the grinding wheel on the edge of the knife or other cutter blade. The adjustment of the guide 19 determines the extent of the engagement between the grinding wheel and blade being sharpened, so that a bevel of the desired depth can be ground on the blade. In the operation of the device the blade is placed flat upon the bed 14 and moved upwardly on the bed into engagement with the grinding wheel until the edge of the blade engages with the guide members 23.

If the cut is a light one the blade can be moved longitudinally with its edge in contact with the stop members **23**. If a cut of considerable depth is taken successive portions of the blade can be moved longitudinally of the slot **20** into engagement with the stops **23**, after which the edge may be smoothed by movement of the blade longitudinally with its edge in contact with the guide members **23**.

The pivotal connection formed by the pin **12** and socket **13** is a detachable connection, the pin **12** being separable from the socket when the attachment is moved laterally when respect of the housing. Whenever the attachment is swung outwardly on the pivot **12** far enough to free the lugs **16** and **17** from the housing **7**, the attachment can be moved laterally until it is detached from the housing. In order to facilitate the attachment and removal of the attachment, a handle **27** is provided adjacent the lower end of the attachment on the outer side thereof so that the operator can grasp the knob of the adjusting screw **26** with one hand and the handle **27** with the other and conveniently swing the attachment to free the lugs **16** and **17** from the housing and then shift the attachment laterally to free the pin **12** from the socket **13**. In placing the attachment on the housing the pin is inserted in the socket **13** and the attachment moved laterally until the slot **20** is alined with the grinding wheel **5**, after which the attachment is lowered into engagement with the housing **7**.

It is to be understood that in accordance with the provisions of the patent statutes, variations and modifications of the specific devices herein shown and described may be made without departing from the spirit of the invention.

What I claim is:

1. The combination with a grinding wheel and a housing for said wheel that encloses the major portion thereof and that has a peripheral opening that extends downwardly and laterally from adjacent the top of the housing to expose a portion of the wheel periphery, of a blade sharpening attachment having a detachable pivotal connection to said housing adjacent the lower end of said opening, said pivotal connection comprising a pin and a pin bearing carried, one by the housing and the other by said attachment and having a common axis parallel to the wheel axis, said pin and bearing being separable upon a lateral movement of said attachment relative to said housing, said attachment having a flat bed portion provided with an elongated opening to receive a portion of the periphery of said wheel and being movable about its pivotal axis into and out of a position overlying said opening, said attachment having inwardly projecting lugs engageable with the housing when said attachment is moved to a position overlying said opening to hold said attachment against lateral movements with respect to said housing, a stop member limiting the movement of said attachment toward said wheel axis, said stop member being adjustable to position said bed at different distances from the wheel axis, a guide member overlying said bed and having blade engaging portions alined transversely of said slot in substantial axial alinement with the periphery of said wheel to limit movement of a blade on said bed toward the grinding wheel while permitting lateral movement of said blade on said bed, and means for adjusting said guide member longitudinally of said slot.

2. In combination with a support and a grinding wheel mounted on said support for rotation about its axis, an attachment comprising a bed having a flat blade supporting surface and an opening therethrough, means for mounting said bed on said support with said blade supporting surface parallel to and facing away from said axis and a peripheral portion of said wheel projecting through said opening, a guide member mounted for movement along said bed, said guide member having a pair of blade engaging surfaces in fixed positions thereon spaced at opposite sides of said opening for receiving said portion of said wheel therebetween, said blade engaging surfaces being aligned in a direction parallel to said axis, means restraining movement of said guide member to translation along a path parallel to said blade supporting surface and transversely with respect to said axis, and means for securing said guide member at selected positions along said path in which said blade engaging surfaces face away from a radial plane containing said axis and perpendicular to said blade supporting surface, whereby a knife blade placed flat on said bed with its cutting edge directed toward said blade engaging surfaces may be moved along said bed toward said blade engaging surfaces and the periphery of said wheel.

3. In combination with a support and a grinding wheel mounted on said support for rotation about its axis, an attachment comprising a bed having a flat blade supporting surface and an opening therethrough, means for mounting said bed on said support with said blade supporting surface parallel to and facing away from said axis and a peripheral portion of said wheel projecting through said opening, a guide member mounted for movement along said bed, said guide member having a pair of blade engaging surfaces in fixed positions thereon spaced at opposite sides of said opening for receiving said portion of said wheel therebetween, said blade engaging surfaces intersecting the plane of said blade supporting surface and being aligned in a direction parallel to said axis, means restraining movement of said guide member to translation along a path parallel to said blade supporting surface and transversely with respect to said axis, and means for securing said guide member at selected positions along said path in which said blade engaging surfaces face away from a radial plane containing said axis and perpendicular to said blade supporting surface, whereby a knife blade placed flat on said bed with its cutting edge directed toward said blade engaging surfaces may be moved along said bed toward said blade engaging surfaces and the periphery of said wheel.

4. In combination with a support and a grinding wheel mounted on said support for rotation about its axis, an attachment comprising a bed having a flat blade supporting surface and an opening therethrough, means for mounting said bed on said support with said blade supporting surface parallel to and facing away from said axis and a peripheral portion of said wheel projecting through said opening, a guide member mounted for movement along said bed, said guide member having a pair of blade engaging surfaces in fixed positions thereon spaced at opposite sides of said opening for receiving said portion of said wheel therebetween, said blade engaging surfaces being aligned in a direction parallel to said axis, means restraining movement of said guide member to translation along a path parallel to said blade supporting surface and transversely with respect to said axis, and means for securing said guide member at selected positions along said path in which said blade engaging surfaces face away from a radial plane containing said axis and perpendicular to said blade supporting surface, whereby a knife blade placed flat on said bed with its cutting edge directed toward said blade engaging surfaces may be moved along said bed toward said blade engaging surfaces and the periphery of said wheel, and means for adjusting said attachment toward and away from said axis and for limiting movement thereof toward said axis.

5. In combination with a support and a grinding wheel mounted on said support for rotation about its axis, an attachment comprising a bed having a flat blade supporting surface and an opening therethrough, means for mounting said bed on said support with said blade supporting surface parallel to and facing away from said axis and a peripheral portion of said wheel projecting through said opening, a guide member mounted for move-

ment along said bed, said guide member having a pair of blade engaging surfaces spaced at opposite sides of said opening for receiving said portion of said wheel therebetween, said blade engaging surfaces being aligned in a direction parallel to said axis, means restraining movement of said guide member to translation along a path parallel to said blade supporting surface and transversely with respect to said axis, and means for securing said guide member at selected positions along said path in which said blade engaging surfaces face away from a radial plane containing said axis and perpendiculr to said blade supporting surface, whereby a knife blade placed flat on said bed with its cutting edge directed toward said blade engaging surfaces may be moved along said bed toward said blade engaging surfaces and the periphery of said wheel, said mounting means for said bed including a pivotal connection having its pivotal axis parallel to and spaced from the axis of said wheel, whereby said bed may be swung toward and away from the axis of said wheel to vary the projection of the wheel through said opening.

6. In combination with a support and a grinding wheel mounted on said support for rotation about its axis, an attachment comprising a bed having a flat blade supporting surface and an opening therethrough, means for mounting said bed on said support with said blade supporting surface parallel to and facing away from said axis and a peripheral portion of said wheel projecting through said opening, a guide member mounted for movement along said bed, said guide member having a pair of blade engaging surfaces spaced at opposite sides of said opening for receiving said portion of said wheel therebetween, said blade engaging surfaces being aligned in a direction parallel to said axis, means restraining movement of said guide member to translation along a path parallel to said blade supporting surface and transversely with respect to said axis, and means for securing said guide member at selected positions along said path in which said blade engaging surfaces face away from a radial plane containing said axis and perpendicular to said blade supporting surface, whereby a knife blade placed flat on said bed with its cutting edge directed toward said blade engaging surfaces may be moved along said bed toward said blade engaging surfaces and the periphery of said wheel, said mounting means for said bed including a pivotal connection having its pivotal axis parallel to and spaced from the axis of said wheel, whereby said bed may be swung toward and away from the axis of said wheel to vary the projection of the wheel through said opening, and adjustable stop means for limiting swinging movement of said bed toward the axis of said wheel.

7. In combination with a grinding wheel mounted for rotation about its axis in a housing having a peripheral wall encircling the major portion of the wheel and a peripheral opening exposing a portion of the periphery of the wheel, a blade sharpening attachment mounted on said housing for pivotal movement about an axis parallel to and spaced from the axis of the wheel, said attachment comprising a bed having a flat blade supporting surface parallel to and facing away from said axis, an opening through said surface receiving an exposed portion of said wheel, stop means for positioning said bed and limiting the distance said wheel projects through said opening, a blade guide mounted for translation along said blade supporting surface and transversely with respect to said axis, said blade guide having a blade engaging surface extending parallel to said axis and transversely to and closely adjacent said blade supporting surface, and means for securing said blade guide in selected positions of adjustment with said blade engaging surface facing away from the midpoint of the periphery of that portion of said wheel projecting through said opening.

8. In combination with a grinding wheel mounted for rotation about its axis in a housing having a peripheral wall encircling the major portion of the wheel and a peripheral opening exposing a portion of the periphery

of the wheel, a blade sharpening attachment mounted on said housing for pivotal movement about an axis parallel to and spaced from the axis of the wheel, said attachment comprising a bed having a flat blade supporting surface parallel to and facing away from said axis, an opening through said surface receiving an exposed portion of said wheel, adjustable stop means for positioning said bed and limiting the distance said wheel projects through said opening, a blade guide mounted for translation along said blade supporting surface and transversely with respect to said axis, said blade guide having a pair of blade engaging surfaces disposed on opposite sides of said wheel and in alignment along lines parallel to said axes, said blade engaging surfaces extending outwardly from the plane of said blade supporting surface, and means for securing said blade guide in selected positions of adjustment with said blade engaging surfaces facing away from the midpoint of the periphery of that portion of said wheel projecting through said opening.

9. In combination with a grinding wheel mounted for rotation about its axis in a housing having a peripheral wall encircling the major portion of the wheel and a peripheral opening exposing a portion of the periphery of the wheel, a blade sharpening attachment mounted on said housing for pivotal movement about an axis parallel to and spaced from the axis of the wheel, said attachment comprising a bed having a flat blade supporting surface parallel to and facing away from said axis, an opening through said surface receiving an exposed portion of said wheel, adjustable stop means for positioning said bed and limiting the distance said wheel projects through said opening, means projecting from said bed and engaging said housing in all positions of adjustment and said stop means to restrain movement of the bed parallel to said axes during such adjustment, a blade guide mounted for translation along said blade supporting surface and transversely with respect to said axes, said blade guide having at least one blade engaging surface extending parallel to said axes and outwardly from the plane of said blade supporting surface, and means for securing said blade guide in selected positions of adjustment with said blade engaging surface facing away from the midpoint of the periphery of that portion of said wheel projecting through said opening.

10. In combination with a grinding wheel mounted for rotation about its axis in a housing having a peripheral wall encircling the major portion of the wheel and a peripheral opening exposing a portion of the periphery of the wheel, a blade sharpening attachment mounted on said housing for pivotal movement about an axis parallel to and spaced from the axis of the wheel, said attachment comprising a bed having a flat blade supporting surface parallel to and facing away from said axis, an opening through said surface receiving an exposed portion of said wheel, stop means for positioning said bed and limiting the distance said wheel projects through said opening, means projecting from said bed and engaging said housing in all positions of adjustment of said stop means to restrain movement of the bed parallel to said axes during such adjustment, a blade guide mounted for translation along said blade supporting surface transversely with respect to said axes, said blade guide having at least one blade engaging surface extending parallel to said axes and outwardly from the plane of said blade supporting surface, and means for securing said blade guide in selected positions of adjustment with said blade engaging surface facing away from the midpoint of the periphery of that portion of said wheel projecting through said opening, the connection of said attachment to said housing comprising a pin and bearing separable upon lateral movement of the attachment relative to the housing when the attachment has been swung about its pivotal axis to move said wheel out of said opening.

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