

[54] **PORTABLE VALVE FACER**

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[58] Field of Search **51/170 R, 170 T, 241 VS, 241 S, 51/241 R, 248, 131, 132**

[56] **References Cited**

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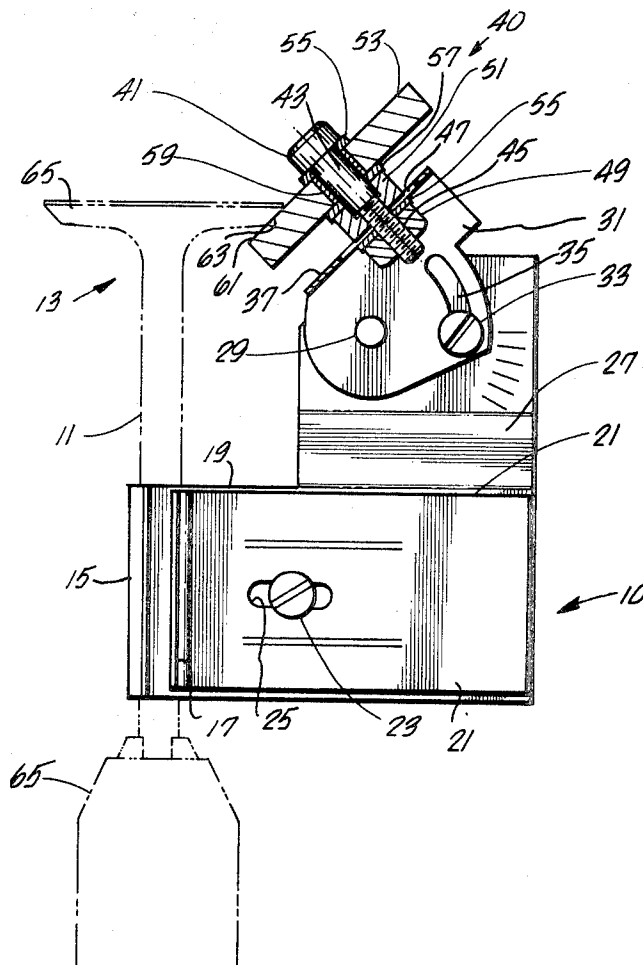
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ABSTRACT

A portable valve facer is disclosed for grinding the seating face of a valve. The valve facer includes adjustable mounting plates having arcuate sections cooperating to rotatably support the valve stem. One of the plates further defines an extension that pivotally supports a sector having a slotted flange for receiving a grinding wheel assembly. Adjustment means are also provided for varying the angular and linear position of the grinding wheel assembly to enable the grinding wheel to engage the seating face of various diameter valve heads. The valve stem is adapted to be rotatably driven by a hand drill or the like with the rotary motion of the valve head causing the seating face to frictionally rotate the grinding wheel. During such movement, the frictional motion to the grinding wheel with the grinding action interengagement causes the grinding wheel to grind the surface of the seating face.

16 Claims, 3 Drawing Figures



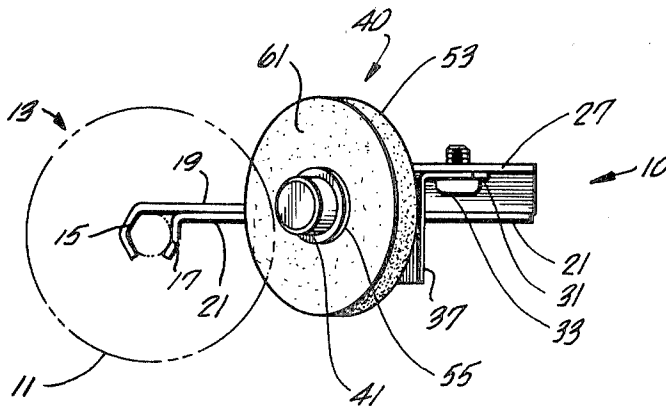


Figure 1

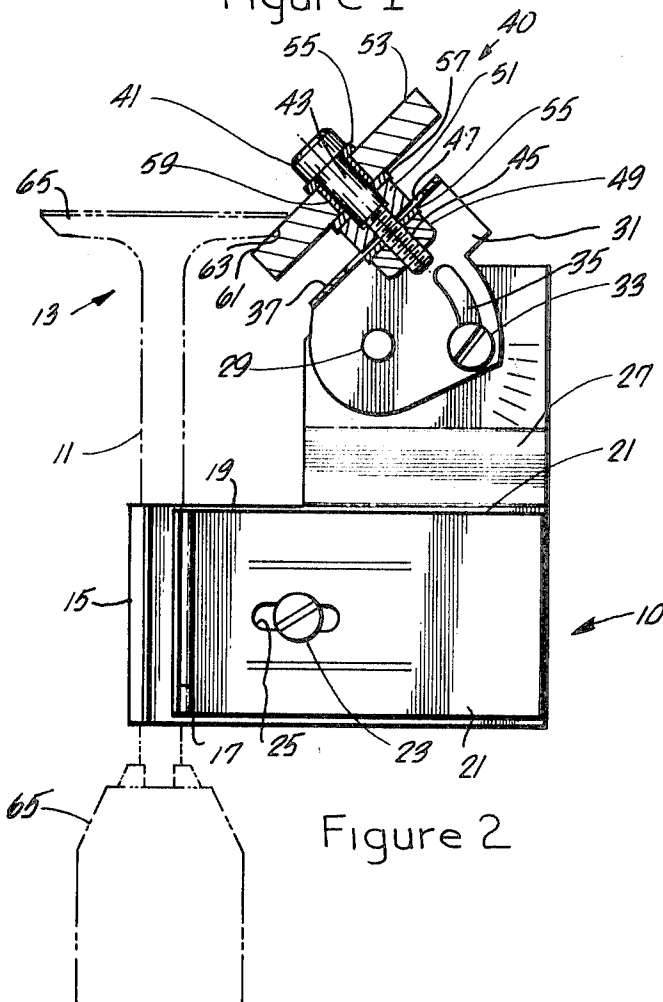


Figure 2

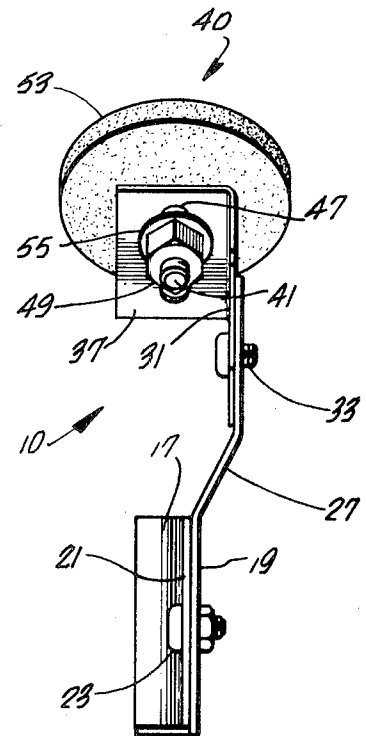


Figure 3

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PORTABLE VALVE FACER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to valve facers and more particularly to a portable valve facer adapted to be powered from hand-held drills or the like.

2. Description of the Prior Art

Valve facing is accomplished by grinding the seating face of the valve head with a grinding wheel or the like. In most instances the grinding wheel is set at an angle corresponding to the valve face angle. At that setting the grinding wheel is brought into contact with the valve face and both the grinding wheel and the valve are rotatably driven.

Heretofore, both the valve and the grinding wheel were rotatably supported on lathe type structures that were very large and quite expensive. Because of these factors such machines are usually found only in large shops and service departments. The operators of small garages or service stations are at a disadvantage since they can not usually afford the cost of such an apparatus. Moreover, the large size of the apparatus prohibits their utilization in such places.

SUMMARY OF THE INVENTION

The present invention obviates the above mentioned shortcomings by providing a valve facer that is easy and safe to operate, reasonable to afford, and simple in construction.

The valve facer includes adjustable mounting plates having arcuate end sections cooperating to rotatably support the valve stem. One of the plates further defines an extension that pivotally supports a sector for angular adjustment with respect to the extension. The sector further includes a slotted flange for rotatably supporting a grinding wheel assembly. The angular setting of the sector and the linear setting of the grinding wheel assembly can be adjusted to enable the grinding wheel to frictionally engage seating faces of various diameter valve heads. Lock nuts are provided to adjust the linear position of the grinding wheel along the slot of the flange and to ensure proper rotation of the grinding wheel without wobbling. The valve stem, rotatably supported by the arcuate sections of the plates, is adapted to be placed into the chuck of a hand drill or the like, with the valve facer being held by hand during rotation of the valve stem. Upon frictional engagement of the valve head with the grinding wheel, the rotary motion of the valve head imparts a rotary motion to the grinding wheel with the grinding action taking place during such frictional engagement.

A primary advantage of the present invention is that it is portable and lightweight in construction. Moreover, since it is quite simple in construction, it can be easily and safely operated.

Another advantage of the apparatus of the present invention is that such an apparatus is relatively inexpensive, thereby making it possible for owners of small shops and service stations to utilize them. In fact, such a device is easily affordable for home use.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top elevational view of the valve facer of the present invention;

FIG. 2 is a side elevational view, partly in section, of the valve facer of the present invention; and

FIG. 3 is a front elevational view of the valve facer of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, FIGS. 1-3 illustrate a portable valve facer, generally indicated by arrow 10, that is easily adjustable to fit all types and sizes of valves, both domestic and foreign made. As will be brought out in the specification, the valve facer 10 is portable, easy to use, and adapted to be powered by any type hand drill, drill press, lathe, or the like.

The valve facer 10 is adapted to be rotatably mounted on the stem 11 of a valve, generally indicated by arrow 13, by means of a pair of arcuate sections 15 and 17 formed on the ends of a pair of plates 19 and 21, respectively. The plates 19 and 21 are held together by set screw means 23 extending through an aperture (not shown) of the plate 19 and a slot 25 of the plate 21. When loosened the slot 25 enables the plate 21 to laterally move with respect to the plate 19. This movement permits the arcuate sections 15 and 17 to separate to allow the valve stem 11 to be inserted or withdrawn from therebetween. This movement also permits the arcuate sections 15 and 17 to adjust to any size of stem diameter. The set screw means 23, of course, are tightened to secure the plates 19 and 21 and the arcuate sections 15 and 17 in a stem engaging position as shown in the figures.

The plate 19 further includes an integrally formed upper section 27 for pivotally supporting, by means of a pin 29, a sector 31. The angular setting of the sector 31 is adjustable by means of a second set screw 33 which also extends through an aperture (not shown) of the upper section 27 and an arcuate slot 35 of the sector 31.

The upper portion of the sector 31 is folded over to form a flange 37 which is adapted to rotatably support a grinding wheel assembly, generally indicated by arrow 40.

The grinding wheel assembly 40 includes a bolt 41 having a cylindrical bearing portion 43 and a threaded portion 45. The threaded portion 45 extends through an elongated slot 47 formed in the flange 37 and is adapted to be secured thereto by means of a pair of locknuts 49 and 51. The bearing portion 43 is adapted to rotatably support a grinding wheel 53.

A pair of washers 55 and 57 are also mounted on the bearing portion 43 on both sides of the grinding wheel 53 while the cylindrical hub portion of the grinding wheel 53 is adapted to receive a bushing 59 press fitted thereto.

As can be seen by the drawings, the upper surface 61 of the grinding wheel 53 is adapted to engage the seating face 63 of the valve head 65. The angular setting of the grinding wheel 53 is, of course, adjustable by the set screw 33 to permit the surface 61 to be aligned as closely as possible to the angle of the seating face 63.

Moreover, the grinding wheel 53 is linearly adjustable to enable the wheel 53 to move laterally in order to adjust to any size valve head diameter. This is accomplished by loosening the locknut 49 and moving the grinding wheel assembly 40 along slot 47 until the desired grinding wheel-valve face engagement is made.

The locknut 49 and 51 further function to put the right amount of compressive force on the grinding wheel 53 to enable it to easily rotate but without wobbling.

Once the valve facer 10 is attached to the valve stem 11 and the desired linear and angular settings are made to enable the grinding surface 61 of the grinding wheel 53 to engage the seating face 63, the lower end of the valve stem 11 is locked within a chuck 65 of the hand drill or the like (not shown).

The drill is then turned on to rotate the valve 13. The valve facer 10 is held by hand to prevent it from rotating with the valve 13. However, the rotary movement of the valve head 65 causes the seating face 63 to frictionally rotate the grinding wheel 53. During such movement, the frictional interengagement causes the grinding wheel to grind the surface of the seating face 63.

As shown in FIG. 1, it is also preferable to have the centerlines of the valve head 65 and the grinding wheel 53 laterally offset to enhance the frictional drive therebetween.

It is important to note that the grinding wheel 53 must be able to freely rotate along with the valve head 65 for the rotary motion enables the grinding wheel to throw off the shavings made during the grinding process. If the grinding wheel 53 were stationary, the shavings would then accumulate on the one grinding spot on the wheel and would shortly gum up the grinding surface and render the wheel 53 ineffectual.

It should also be noted that the washers 55 and 57 and the bushing 59 could be of either metal or of a fiber material such as Teflon.

As can be seen, a portable and easily usable valve facer is provided that can conveniently adjust to any desired setting to fit any size valve.

It should be noted that various modifications can be made to the apparatus while still remaining within the purview of the following claims.

What is claimed is:

1. A portable valve facer for grinding the seating face of a valve comprising:

means for receiving and supporting the valve stem as it is rotatably driven by a hand drill or the like;

means for adjusting the support means to enable the support means to receive various sizes of valve stems;

mounting means, pivotally connected to a portion of said support means, for supporting a grinding wheel assembly; and

a grinding wheel assembly having a grinding wheel rotatably supported on said mounting means and adapted to engage and be frictionally rotated by the seating face of the valve.

2. The invention of claim 1 wherein said mounting means further comprises means for adjusting the angular position of said grinding wheel with respect to the seating face of the valve.

3. The invention of claim 1 wherein said mounting means further comprises means for adjusting the linear position of said grinding wheel with respect to the seating face of the valve.

4. The invention of claim 2 wherein said angular adjusting means comprises an arcuate slot formed on said mounting means with set screw means extending in said slot selectively locking said mounting means to the portion of said mounting means.

5. The invention of claim 3 wherein said linear adjusting means includes an elongated slot formed on said mounting means with the grinding wheel assembly including a grinding wheel shaft extending through said slot.

6. The invention of claim 5 wherein said grinding wheel assembly further comprises lock nut means on said grinding wheel shaft for selectively securing said shaft to mounting means.

7. The invention of claim 6 wherein said lock nut means further adjusts the compressive force on said grinding wheel.

8. The invention of claim 1 wherein said support means includes a pair of contiguous plates having a pair of cooperating arcuate sections adapted to extend around the valve stem.

9. The invention of claim 8 wherein said adjusting means comprises one of said plates having a slot formed therein and a set screw extending in said slot for selectively locking said

plates together.

10. A portable valve facer for grinding the seating face of a valve comprising:

means for supporting the valve stem as it is rotatably driven by a hand drill or the like; mounting means, pivotally connected to a portion of said support means, for supporting a grinding wheel assembly, said mounting means further comprises means for adjusting the angular position of the grinding wheel with respect to the seating face of the valve, said angular adjusting means comprises an arcuate slot formed on said mounting means with set screw means extending in said slot selectively locking said mounting means to the portion of said mounting means; and

a grinding wheel assembly having a grinding wheel rotatably supported on said mounting means and adapted to engage and be frictionally rotated by the seating face of the valve.

11. A portable valve facer for grinding the seating face of a valve comprising:

means for supporting the valve stem as it is rotatably driven by a hand drill or the like;

mounting means, pivotally connected to a portion of said support means, for supporting a grinding wheel assembly, said mounting means further comprises means for adjusting the linear position of said grinding wheel with respect to the seating face of the valve, said linear adjusting means comprises an elongated slot formed on said mounting means with grinding wheel assembly including a grinding wheel shaft extending through said slot; and

a grinding wheel assembly having a grinding wheel rotatably supported on said mounting means and adapted to engage and be frictionally rotated by the seating face of the valve.

12. The invention of claim 11 wherein said grinding wheel assembly further comprises lock nut means on said grinding wheel shaft for selectively securing said shaft to mounting means.

13. The invention of claim 12 wherein said lock nut means further adjusts the compressive force on said grinding wheel.

14. A portable valve facer for grinding the seating face of a valve comprising:

means for supporting the valve stem as it is rotatably driven by a hand drill or the like, said supporting means comprises a pair of contiguous plates having a pair of cooperating arcuate sections adapted to extend around the valve stem;

mounting means, pivotally connected to a portion of said support means, for supporting a grinding wheel assembly; and

a grinding wheel assembly having a grinding wheel rotatably supported on said mounting means and adapted to engage and be frictionally rotated by the seating face of the valve.

15. The invention of claim 14 further comprising means for adjusting the position of one plate with respect to the other to vary the distance between the arcuate sections.

16. The invention of claim 15 wherein said adjusting means comprises one of said plates having a slot formed therein and a set screw extending in said slot for selectively locking said plates together.

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