May 6, 1958 D. W. BUTLER 2,833,035

CUTTING AND GROOVING TOOL

Filed Oct. 29, 1956

Fig. 4

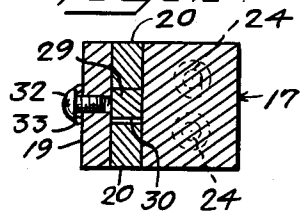


Fig. 1

Fig. 2

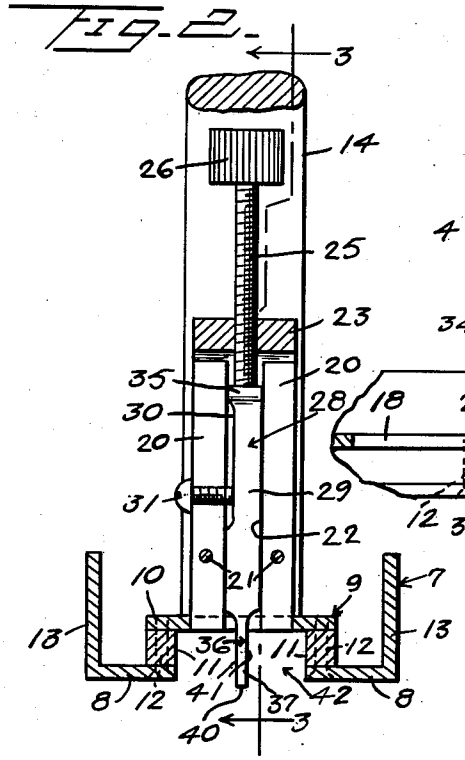
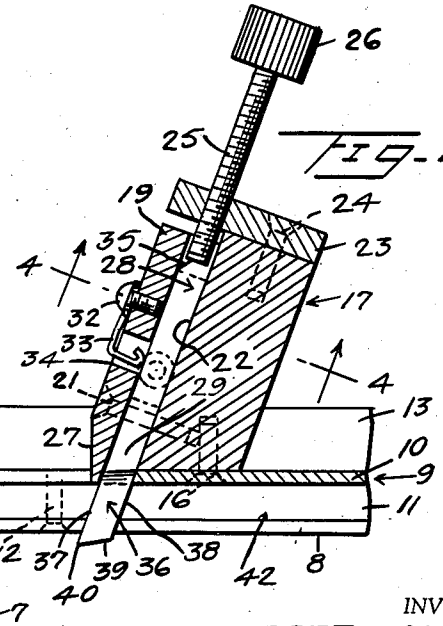


Fig. 3



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2,833,035

Patented May 6, 1958

2,833,035

CUTTING AND GROOVING TOOL

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Application October 29, 1956, Serial No. 618,723

3 Claims. (Cl. 30—293)

This invention relates to a novel tool primarily adapted for use in accurately cutting hard materials such as Masonite, pressed asbestos, Transite, flexiboard, and various plastics, which materials cannot be readily sawed without quickly dulling the saw.

A primary object of the present invention is to provide a tool of this character having novel means for accommodating the cuttings which are usually in a fine form.

Still a further object of the invention is to provide a tool of the aforedescribed character which may be used for accurately grooving the aforementioned materials and various other materials.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a side elevational view, partly in vertical section, of the tool;

Figure 2 is an enlarged cross sectional view thereof, taken substantially along a plane as indicated by the line 2—2 of Figure 1;

Figure 3 is a fragmentary longitudinal sectional view of a portion of the tool, taken substantially along a plane as indicated by the line 3—3 of Figure 2, and

Figure 4 is a cross sectional view through a part of the tool, taken substantially along a plane as indicated by the line 4—4 of Figure 3.

Referring more specifically to the drawing, the cutting and grooving tool in its entirety and comprising the invention is designated generally **6** and includes an elongated stock, designated generally **7**. The stock **7** includes corresponding coplanar bottom portions **8** which extend from end-to-end of the stock and which are disposed in laterally spaced relation to one another and which are connected to one another by an elongated intermediate portion **9** of the stock **7** which is of arch shaped cross section. Said arch shaped intermediate portion **9** includes a substantially flat top wall **10** which extends from end-to-end of the stock **7** and side walls **11** which are supported on and rise from the bottom portions **8**, adjacent the inner edges thereof, and which bear against the underside of the top wall **10**, adjacent its longitudinal side edges. The side walls **11** are shown connected to the bottom portions **8** and the top wall **10** by fastenings **12**. However, the parts **8**, **10** and **11** may be formed integral with one another. The stock **7** also includes corresponding side walls **13** which extend upwardly from the outer edges of the bottom portions **8** and which are preferably formed integral therewith. The side walls **13** extend from end-to-end of the stock and preferably have their upper edges disposed above the level of the top wall **10**.

A rear handle **14** is fixed to and rises from one end of the top wall **10** and is disposed at a rear end of the tool **6**, and a knob **15** is suitably secured to and rises from the opposite end of the top wall **10**. The handle **14** is adapted to be grasped with one hand and the knob **15** is gripped with the other hand for operating the tool **6**.

A post **17** is suitably secured as by fastenings **16**, one of which is shown in Figure 3, to the upper side of the top wall **10**, between the handle **14** and knob **15**, and extends upwardly from said top wall **10** at an incline toward the handle **14**. An opening **18** is formed in the top wall **10** and extends forwardly from the lower end of the post **17** toward the knob **15**. The post **17** includes a front bar **19** and a pair of laterally spaced spacer bars **20** which are secured to one another and to a part of the post **17** which is fastened to the wall **10**, by fastenings **21**, and which combine to form a guideway or bore **22** of noncircular cross section, a lower end of which opens through a rear end of the opening **18**, and which is provided with an open upper end, as best seen in Figure 3. The upper ends of the bars **19** and **20** terminate below the level of the upper end of the portion of the post **17** which is fixed to the wall **10**, and a top plate **23** is secured, as by fastenings **24**, to said stationary part of the post **17** and has a portion overlying and spaced from the upper ends of the bars **19** and **20**. A feed screw **25** extends threadedly through said portion of the plate **23** and has a lower end extending loosely into the upper end of the bore **22**, as seen in Figures 2 and 3. Said feed screw **25** has a knurled head **26** at its upper end by means of which the feed screw may be turned with the thumb and fingers. The front plate or bar **19** is beveled on its forward side and its lower end, as seen at **27**.

An elongated cutting bit **28** includes an elongated shank **29** of rectangular cross section which fits slidably in the guideway or bore **22** and which has an upper end bearing against the lower end of the screw **25**. As best seen in Figure 2, one side wall of the shank **29** has an elongated recessed portion **30** which terminates at points spaced from the ends thereof. A screw **31** is threaded inwardly through one of the spacer bars **20** and has an inner end which can be advanced sufficiently into the bore **22** to engage loosely in the recessed portion **30** of the bit shank **29**. The screw **31** is spaced slightly from the bed of the recess **30** to permit an unimpeded limited sliding movement of the bit in the bore **22** but is adapted to engage the ends of the recessed portion **30** to prevent complete removal of the bit **28** from the bore **22** through the lower end thereof and to limit upward movement of the bit in said bore, when the screw **31** is in a fully advanced position as seen in Figure 2. A screw **32** is threaded into the front plate **19** and anchors one end of a spring **33** against the outer side of said front plate. An opposite end of the spring **33** extends into the bore **22** through an opening **34** of the front plate and yieldably bears against the bit shank **29** to retain the bit against free sliding movement in the bore **22**. The upper end of the forward side of the shank **29** is beveled as seen at **35** for camming the spring **33** outwardly of the bore **22** as the bit **28** is inserted upwardly through said bore.

The lower end of the bit **28** is recessed on opposite sides thereof to form a cutting and grooving blade or knife **36**, the side walls of which converge relative to one another from the forward face **37** to the rear face **38** thereof, so that the forward face **37** is wider than the rear face. A bottom edge **39** of the knife **36** is disposed at an acute angle to the front face **37** and is inclined slightly upwardly toward the back face **38**, when the bit **28** is mounted in the post **17**, as best seen in Figures 1 and 3. Said bottom edge combines with the front face **37** to form the cutting edge **40** of the knife **36**, which is formed by the apex of the face **37** and edge **39**.

The feed screw **25** is manually adjusted to displace the bit **28** downwardly until the cutting edge **40** thereof

is disposed at a desired level beneath the bottom surface of the stock **7**, as defined by the coplanar bottom faces of the bottom portions **8**. When thus disposed, the tool **6** if manipulated manually utilizing both hands, as previously described, will cause the cutting edge **40** to cut a groove in a piece of material to a desired depth, in combination with the longitudinal side edges of the front face **37** of the knife **36**, which constitute additional cutting edges **41** for cooperation with the bottom cutting edge **40**. Where the tool **6** is utilized for cutting completely through a piece of hard material, the cutting edge **40** is adjusted downwardly to below the bottom surface of the stock **7** to an extent greater than the thickness of the material, so that a complete cut or severence of the material will be accomplished. The bit **28** is formed of high carbon steel which will cut hard materials without being dulled readily. The opening **18** is provided so that the cutting edges **40** and **41** will be visible to the operator during the cutting operation and the beveled surface **27** is also provided for this purpose, so that an accurate cutting or grooving operation can be accomplished.

In cutting hard materials, such as asbestos shingles, Masonite and the like, the cuttings will be in the form of fine small pieces rather than long shavings and which are incapable of escaping through the opening **18**. Accordingly, to prevent such cuttings from clogging the tool and obstructing its proper operation, the stock **7** is provided with the arch shaped intermediate portion **9** which forms a downwardly opening groove or channel **42** which extends from end-to-end of the stock and in which the cuttings are accommodated on either side of the knife **36**. Without the groove **42** efficient operation of the tool **6** in the aforedescribed manner for either cutting or grooving of hard materials cannot be effectively accomplished.

Various modifications and changes are contemplated and may be resorted to without departing from the function or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. A cutting and grooving tool of the character described comprising an elongated stock having laterally spaced coplanar bottom portions extending from end-to-end thereof and an elongated intermediate portion of arch shaped cross section extending from end-to-end of the stock and connecting said bottom portions, said intermediate portion combining with said bottom portions to

define a downwardly opening groove extending from end-to-end of the stock, said arch shaped intermediate portion including a substantially flat top wall disposed above the level of and substantially parallel to said bottom portions, a tool post secured to and extending upwardly from said top wall, said top wall having an opening including a portion disposed beneath a part of the lower end of the tool post , a cutting bit including a shank adjustably mounted in the tool post, said cutting bit having a recessed lower end portion defining a cutting blade extending downwardly through the top wall opening and through a portion of said groove, said blade having a relatively narrow forward face including sharpened side edges disposed between and spaced from the sides of the groove and a sharpened lower end adjustably positioned below the level of said bottom portions of the stock, said side edges and lower end constituting the cutting edges of the blade.

2. A cutting and grooving tool as in claim 1, resilient means supported by said post and having a part bearing against the bit shank for frictionally resisting sliding movement of the bit shank in said bore, and a feed screw threadedly mounted in an upper part of the tool post and having a lower end bearing against the upper end of the bit shank and cooperating with the resilient means to retain the blade in various adjusted positions.

3. A cutting and grooving tool as in claim 1, said cutting bit being supported by the tool post for positioning said cutting bit at an incline such that the front face of the blade is inclined upwardly and rearwardly, and said top wall opening including a portion disposed forwardly of the cutting bit and through which the cutting edges of the blade are visible when the tool is in an operative position.

References Cited in the file of this patent

UNITED STATES PATENTS

535,191	Bretherton	Mar. 5, 1895
620,226	Cole	Feb. 28, 1899
1,031,509	Aylor	July 2, 1912
1,307,151	Rowden et al.	June 17, 1919
1,825,859	Foy	Oct. 6, 1931
2,013,893	Matthews	Sept. 10, 1935
2,715,271	Carrier	Aug. 16, 1955

FOREIGN PATENTS

4,233	Great Britain	Feb. 27, 1893