

Aug. 20, 1957

M. P. MATTHEW

2,803,303

PAPER CUTTING DEVICE AND BOARD THEREFOR

Filed April 27, 1954

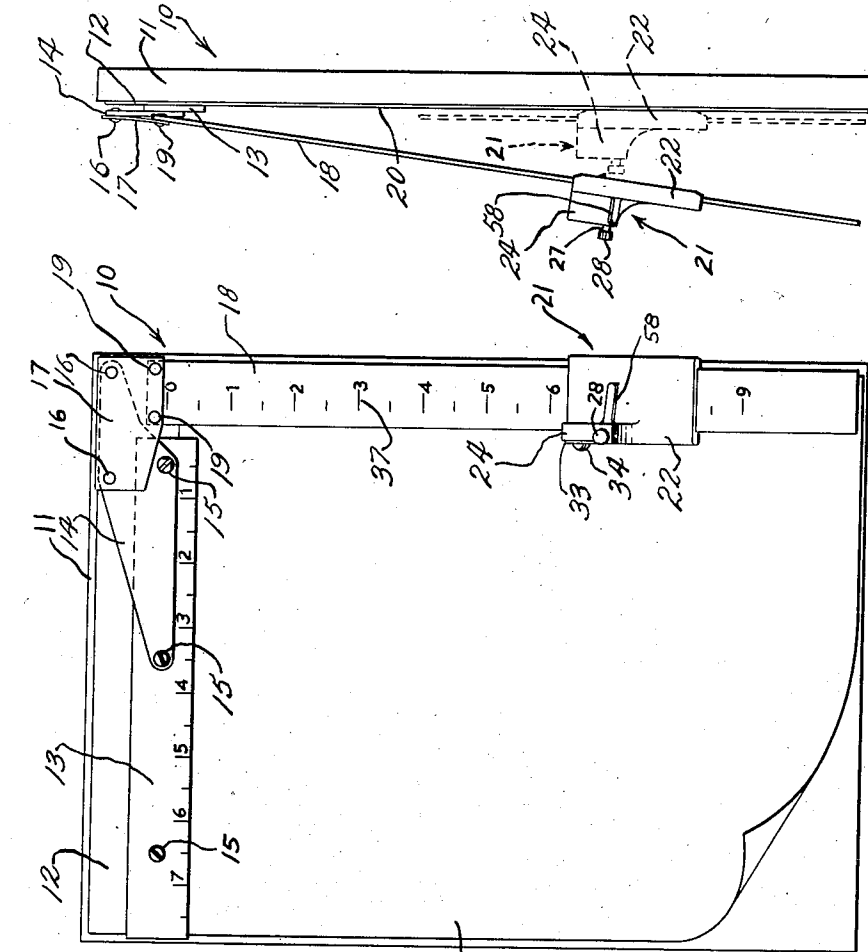


FIG. 5

FIG. 4

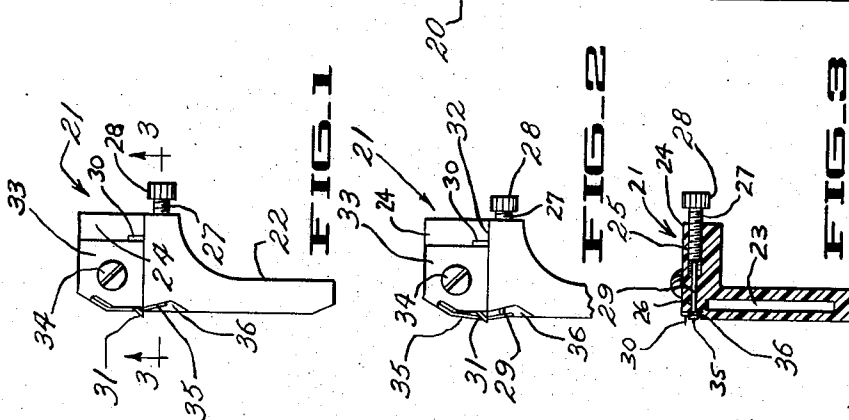


FIG. 1

FIG. 2

FIG. 3

INVENTOR.
MORTON P. MATTHEW
BY
Joseph J. Radon
ATTORNEY

1

2,803,303

PAPER CUTTING DEVICE AND BOARD THEREFOR

Morton P. Matthew, College Park, Md.

Application April 27, 1954, Serial No. 425,811

7 Claims. (Cl. 164—73)

This invention relates to cutting devices and more particularly to devices for cutting sheet material.

It is an object of the present invention to provide a cutting board and cutting devices associated therewith which are designed to easily and accurately cut cardboard or other soft sheet material, which cut material may then be used to fabricate models or the like, such as houses, wagons, automobiles, chairs, tables, engines, aeroplanes, ships, etc.

It is another object of the present invention to provide a cutting board and a cutting tool associated therewith, means being provided for guiding the cutting tool across the cutting board and for automatically raising the cutting tool from the board when not in use.

It is a further object of the present invention to provide a cutting tool for cardboard or other soft sheet material wherein means are provided for accurately varying the depth of cut by a simple operation.

Other objects and features of the present invention are to provide a cutting board and cutting tools associated therewith which are of simple construction, inexpensive to manufacture, have a minimum number of parts, are easy to use and efficient in operation.

Other objects and a better understanding of the invention will become apparent from the following detailed description taken in conjunction with the accompanying drawing, wherein:

Figure 1 is a side elevational view of a cutting tool embodying the features of the present invention and showing a spring blade guard in retracted position for controlling the cutting depth thereof;

Fig. 2 is a fragmentary side elevational view similar to Fig. 1, but showing the spring blade guard in an operative position;

Fig. 3 is a transverse sectional view taken along the line 3—3 of Fig. 1;

Fig. 4 is a top plan view of a cutting board adapted to be used with the cutting tool of Fig. 1; and showing the latter in position thereon ready for use and operation;

Fig. 5 is a side elevational view thereof looking from the right of Fig. 4.

Referring now more in detail to the drawing, wherein similar reference numerals identify corresponding parts throughout the several views; there is shown in Figs. 4 and 5 a cutting board indicated generally as 10 and including a rectangular bed 11 of relatively soft material, substantially as illustrated. A rectangular spacer plate 12 is positioned across the rear end of the bed 11 on the top surface thereof, and serves to mount thereon in spaced relation to the upper face of bed 11 a scale 13 for a purpose which will hereinafter become clear. A plate 14 of parallelogram shape is mounted on top of the scale 13 across the right hand portion thereof, plate 14, scale 13 and the spacer plate 12 being secured to bed 11 by means of the screws 15. It will be noted that scale 13 terminates short of the right hand edge of bed 11 and that the parallelogram plate 14 extends to the rear right corner of the bed where it mounts thereon by means of rivets 16

2

or the like a leaf spring 17 normally biased away from the bed 11.

An elongated metal guide 18 extends along one longitudinal edge of bed 11, the rear end of guide 18 being secured to the undersurface of leaf spring 17 by means of rivets 19 or other suitable means. The leaf spring 17 serves to normally hold guide 18 in the raised position shown in Figs. 4 and 5 away from the top face of bed 11 and also to insure a perpendicular relationship between guide 18 and scale 13.

A sheet 20 of cardboard or the like is normally disposed on bed 11, the rear edge thereof being retained intermediate the forward edge of scale 13 and bed. The sheet 20 is expendable and serves to extend the life of the bed by covering the same and protecting it from the cutting tools to be hereinafter described.

A cutting tool indicated generally at 21 is provided for cooperative action with cutting board 10 and includes a rectangular block 22 of plastic or other suitable material having a rectangular bore 23 as in Fig. 3, which receives therethrough in sliding relationship the guide 18. The block 22 along one longitudinal edge is integrally formed with an upwardly extending lug 24 having a downwardly extending, internally threaded bore 25 communicating with the bottom of the block by means of a smooth bore 26 of less diameter than the bore 25 (Fig. 3). A screw 27 having a knurled head 28 is adjustable within the threaded bore 25 and is provided with a smooth shank 29 which extends downwardly through the lower end of the bore 26. A blade 30 having an inclined cutting edge 31 is positioned against a shoulder 32 (Figs. 1 and 2), provided in the side of lug 24. The blade 30 is secured in position by a clamping plate 33 and a screw 34, which passes through an opening in the clamping plate 33 and is screw threaded into the side of lug 24. A narrow spring 35 is integrally formed along the lower edges of the plate 33 and extends forwardly below the lower end of extension 29 alongside the inner face of the blade 30 (Figs. 1 and 2). The lower edge of block 22 is provided with a groove 36 adapted to receive therewithin the forward end of spring 35 when the screw 27 is in the inoperative position of Fig. 1. The spring 35 bears directly upon and moves over the material being cut during the cutting operation. By adjustment of screw 27 by means of the knurled head 28 thereof, the extension 29 may be made to bear on the spring 35 to move the latter toward the lowermost point of the cutting edge 31. This has the end result of varying the height of the block 22 and blade 30 with respect to the material being cut. Thus, a greater or smaller portion of the projecting blade 30 extends beyond the spring 35 and into the material depending upon the position of spring 35. In this manner, a ready means is afforded for varying the depth of the cut. For most effective cutting, the depth of the cut should be slightly greater than the thickness of the material being cut, this adjustable feature permitting the cutting board 10 to function more efficiently.

Often it is desirable to score or cut a piece of material through only a portion of its thickness, for example when it is to be folded along a definite line. The change from cutting to scoring and vice versa is easily and readily effected by means of the screws 27 and spring 35, as will be obvious. Furthermore, the spring 35 may be adjusted so as to extend downwardly below the lowermost point of the cutting edge 31, thus acting as a safety guard, protecting the user when not cutting as well as protecting the blade from damage in shipping. The blade 30 itself may, of course, be clamped in position by plate 33 so as to make either a deep or a shallow cut, with finer adjustment being provided by screw 27 and guard 35.

The guide 18 is provided with a scale 37.

The device described above is similar in some respects to the common guillotine type of paper cutter or trimming board, having a bed, a scale across the top at its rear and a cutting means perpendicular to the scale along the right side of the bed. However, the present invention differs in that the cutting operation is effected not by shearing but rather by the slicing action of the thin sharp blade 30 through the sheet material, with the tool 21 sliding freely along the guide 18 in the direction of cut. Tool 21 is thus retained against travelling in any path other than the straight line determined by the guide 18, the blade 30 being always parallel to the guide.

In operation, a piece of sheet material is cut by holding it against the scale 13 with one hand and grasping the cutting tool 21 mounted on guide 18 with the other hand, the cutting tool and guide being moved downwardly against the action of leaf spring 17 at the forward end of the guide until the blade 30 enters the material. The tool is then moved rearwardly towards the scale 13, the cutting edge 31 of the blade 30 cutting the material in a straight line perpendicular to scale 13.

It will be noted that the scale 13 increases away from the cutting blade, as in the case of a conventional paper cutter, permitting a piece of sheet material to be cut to any desired width or length.

The scale 37 provided on guide 18 permits the length of the cut to be measured, using the edge of the block 22 for an index. This is particularly useful in partial or inside cuts, where the tool 21 is lowered at one reading of the scale 37 and a cut is made rearwardly as far as another given reading of scale 37.

The bed 11 is made of comparatively soft material, avoiding thereby damage to the cutting blade 30, should it happen to enter the bed.

The cutting tool 21 may be slid completely off the forward end of the guide 18 and used separately as a cutter without guide 18. Used separately, it may be pushed over the surface of the piece of material to be cut, the blade 30 cutting the material either in a straight or curved line. In this case, a straight or convex template not shown may be used to guide the edge of the block 22 adjacent to the blade 30 in the desired path of cutting. The shape of the block 22, it will be noted, is such that the blade 30 will cut directly beneath the edge of the template. The cutting board 10 serves as a work board when the cutting tool 21 is used separately in the aforesaid manner.

It will be readily apparent that the cutting tool 21 may be removed and replaced by various other cutting tools.

The cutting board 10 may also serve as a work board in conjunction with any tools which cut, pierce or otherwise operate on the material.

Referring now particularly to Figs. 6 through 10, there is shown a rotary cutter indicated generally at 38 and including a block 39 of plastic or other suitable material of substantially trapezoidal shaped cross section (Fig. 9), adapted to be used with the cutting board 10.

The cutting board 10 and the cutting tools 21 and 38 may be made up in sets and provided with blanks of unwashed cardboard or other soft sheet material having printed thereon the lines of cut necessary for forming the parts of models, for example automobiles. Glue, or other fastening means, may be provided for assembling the parts along with a supply of blades.

From the preferred embodiments of my invention as illustrated and described, it will be noted that my straight cutting board provides a relatively narrow width of blade penetrating material thus permitting very small cuts to be cleanly made, for example in the cutting of a narrow slot or of a small square hole. Furthermore, the relationship between point of blade, shoulder or the block, leading edge of block and scale markings on cutter guide provide an accurate means for locating a point on a piece of material with respect to the reference edge. For example, the center of a hole may be so located using the

cutter. In addition, freedom of one end of the guide from fastenings, anchoring or locating parts, etc. made possible by the laterally rigid but vertically flexible spring mounting permits the insertion and cutting of pieces of material larger than the cutter itself. Such pieces not only may be partially cut in one operation, but may be completely cut apart in two or more operations. For example, a piece twice as long as the cutting part may be cut half through and then turned end for end and cut the rest of the way. Were the guide dependent at its rear end upon additional mounting means, for support, rigidity, or accuracy of operation, cutting as in this example could be done only with difficulty if at all.

Another method for cutting apart still larger pieces is possible by virtue of the guide mounting members which permit the passing of material rearwardly under them. For example, a large piece may be cut partly through, then fed rearwardly, the material to the right of the cut passing under the guide 18 and part of the plate 14, and the material to the left of the cut passing over the ruler 13 and the other part of the plate 14. After every such movement a new cut may be made, until the piece is eventually cut completely through.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

I claim:

1. An article of the class described comprising a cutting board, a guide extending along the top of said cutting board, a resilient plate fixed at one side to one end of said guide and fixed at the other side to said board to provide a combined hinge and spring normally biasing the other end of said guide away from said cutting board, a block slidable along said guide, and a cutting blade carried by said block and adapted to move in the direction of said guide.

2. An article of the class described comprising a cutting board, a leaf spring secured to said board adjacent one edge of said board, a longitudinal guide secured to said leaf spring at substantially right angles to said one edge of said board and, said leaf spring providing a transversely rigid mounting of said guide to said board while resiliently biasing the end of said guide remote from said one edge of said board and away from said cutting board, a block slidably mounted on said guide and an adjustable cutting edge carried at one longitudinal side of said block and adapted to move in the direction of said guide.

3. An article of the class described comprising a cutting board of soft material, a transverse spacer plate on said cutting board, a transverse scale secured to said spacer plate in overlapping relation thereto, one end of said scale terminating short of the adjacent longitudinal edge of said cutting board, said scale having an edge portion parallel to said spacer plate and projecting beyond the edge of said spacer plate toward the operating area of said board, thereby forming a thin elongated cavity along the top of said board, a longitudinal guide having one end thereof intermediate said one end of said scale and the longitudinal edge of said cutting board, a leaf spring secured to said end of said guide and to said cutting board and adapted to bias the other end of said guide away from said cutting board, a sheet of expendible material on said cutting board, one edge of said material being received in said cavity between said scale and said cutting board adjacent the edge of said spacer plate.

4. An article of the class described comprising in combination a cutting board, a guide on the top of said cutting board, a leaf spring rigidly fixed at one end to said board and at the other end to said guide for mounting one end of said guide on said board and normally biasing the other end of said guide away from said board, and a cutting tool slidably mounted on said guide adapted to bear on material provided on said cutting board, said cutting tool comprising a block slidable along said guide,

5

a cutting blade fixed to said block, a removable plate secured to one longitudinal side of said block with said blade being positioned intermediate said plate and the side of said block, a flat spring along the lower edge of said plate adjacent said cutting blade and a set screw 5 screw threaded through said block bearing on said spring, the lower face of said spring bearing directly on the material to be cut.

5. An article of the class described comprising in combination a cutting board, a guide on the top of said cutting board, a leaf spring rigidly fixed at one end to said board and at the other end to said guide for mounting one end of said guide on said board and normally biasing the other end of said guide away from said board, and a cutting tool 10 slidably mounted on said guide adapted to bear on material provided on said cutting board, said cutting tool comprising a block slidably along said guide, an upstanding lug at one side of said block, a recess at the outer side of said lug providing a shoulder, a cutting blade 20 fixed against said shoulder and depending from said block, said blade having an inclined cutting edge, a clamp plate within said recess, said plate being positioned intermediate said block and clamping plate, releasable fastening means for securing said plate to said block, a flat spring along the lower edge of said plate and block adjacent the lower 25 end of said cutting blade, the lower face of said spring bearing directly on the material to be cut, and a set screw screw threaded through said lug and bearing on said spring whereby to vary the depth of cut.

6. A cutting tool comprising, a block having a lower bearing surface, a cutting blade, means for fixing said cutting blade to said block with the lowermost edge thereof extending below said bearing surface, at least a portion of said bearing surface adjacent said blade being vertically adjustable, and means for selectively fixing said adjustable 35 portion in any one of a plurality of vertical positions with respect to said cutting blade.

7. A cutting tool comprising, a block, a cutting blade,

6

means for fixing said cutting blade to said block with the lowermost edge of said blade extending below the bottom of said block, a generally flat spring mounted to said block, a portion of said spring positioned adjacent said blade to provide a bearing surface, a set screw threaded through said block, said spring bearing upwardly against said screw, whereby said bearing surface may be vertically adjusted with respect to said blade by turning said set screw.

References Cited in the file of this patent

UNITED STATES PATENTS

Re. 17,085	Thomas	Sept. 18, 1928
83,143	Ellsworth	Oct. 20, 1868
228,686	Smith	June 8, 1880
237,280	Hoopes et al.	Feb. 1, 1881
1,170,133	Alexander	Feb. 1, 1916
1,217,870	Klaes	Feb. 27, 1917
1,306,261	Klein	June 10, 1919
1,905,837	Flink	Apr. 25, 1933
2,013,893	Matthews	Sept. 10, 1935
2,101,458	Sachtleben	Dec. 7, 1937
2,117,153	Diamond	May 10, 1938
2,168,752	Sigmond	Aug. 8, 1939
2,183,376	Wikle	Dec. 12, 1939
2,190,049	Sperry	Feb. 13, 1940
2,245,959	Brown	June 17, 1941
2,293,264	Leslie	Aug. 18, 1942
2,413,544	Carpenter	Dec. 31, 1946
2,556,240	Valentine et al.	June 12, 1951
2,626,665	Chamberlain	Jan. 27, 1953
2,692,020	Oberhardt	Oct. 19, 1954

FOREIGN PATENTS

103,662	Switzerland	Mar. 1, 1924
604,056	France	Jan. 16, 1926
785,948	France	Aug. 22, 1935