Nov. 17, 1959 E. M. KEY 2,913,024

SPLITTER KNIFE

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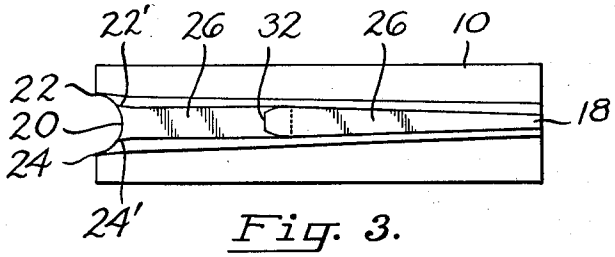


Fig. 3.

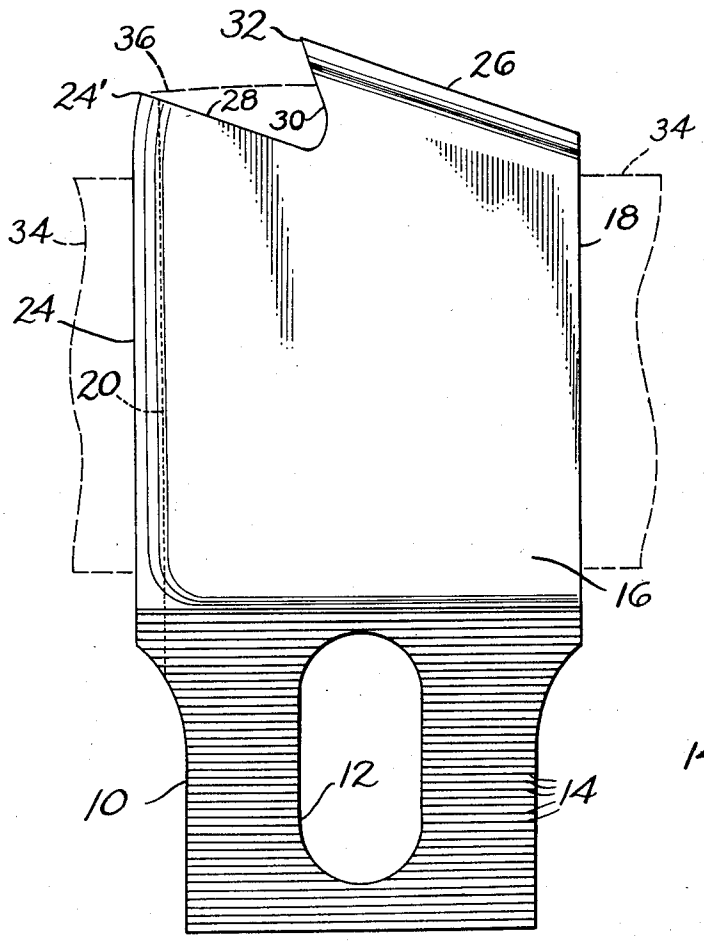


Fig. 1.

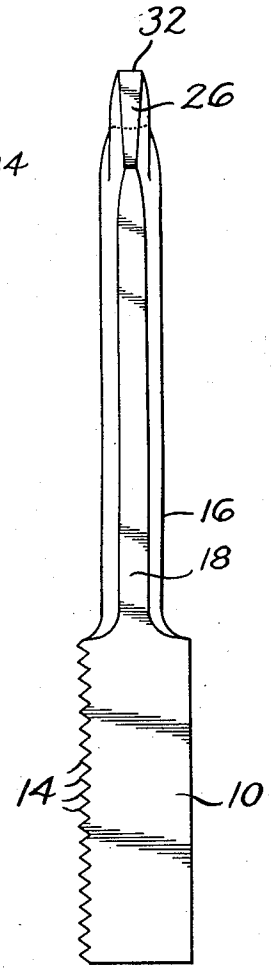


Fig. 2.

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SPLITTER KNIFE

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This invention pertains to wood cutting tools, and relates particularly to a splitter knife of improved construction.

In the production of finished lumber, wherein one stage of operation involves the planing of rough cut lumber to smooth surfaces on all sides, it is a general practice, when desired, to split the lumber into two or more boards of narrower width. As an illustration, a quantity of rough 2" x 12" dimension may be processed through the planer to produce finished lumber which, for example, is third grade. However, the character of the lumber may be such that it could produce a third grade 2" x 8" and a first grade 2" x 4". Thus, greater value may be derived by splitting. As another illustration, it is a general practice in many saw mills first to cut all logs to 2" x 12" rough dimension and then to split and finish them into three 2" x 4", two 2" x 6", or one 2" x 8" and one 2" x 4", whichever is desired for sale.

Whatever is the purpose of splitting, it is apparent that if the board is split before planing, the lineal footage of lumber to be processed through the planer is doubled and the cost of producing the finished lumber is increased proportionately. It is most desirable, therefore, to split lumber after planing.

Since the splitting of planed lumber with a conventional saw blade produces rough surfaces defining the kerf, and thus would necessitate reprocessing through the planer, attempts have been made heretofore to provide a splitter knife which would perform the splitting operation while simultaneously producing smooth finished surfaces defining the kerf. Such splitter knives as have been employed and proposed heretofore have not been satisfactory, for the following reasons:

Splitter knives heretofore have failed to produce kerf surfaces free of scratches, regardless of their degree of sharpness. This fact has resulted in such general dissatisfaction with plit lumber that many purchase orders specifically rule against it. Moreover, such splitter knives have failed to maintain a sufficiently sharp cutting edge for a practical period of time. Under normal operating conditions it has been found that such knives require resharpening after about one hour of use in order to maintain the production of kerf surfaces of even minimum satisfactory smoothness. Thus, since it is economically unfeasible to interrupt production so frequently, it has been the practice heretofore to continue the use of such dulled spliter knives notwithstanding the fact that the lumber thus produced is unsalable at the price of its grade. Still further, the use of splitter knives heretofore has required a feed rate of lumber substantially less than the feed rate permissible for other sawmill operations.

It is a principal object of the present invention to provide a splitter knife which is capable of splitting lumber efficiently while simultaneously producing kerf surfaces which are as smooth as can be produced by the best planers.

Another important object of this invention is to provide a splitter knife which is capable of producing consistently smooth kerf surfaces for substantially longer periods of continued use than has been possible heretofore.

Still another important object of this invention is to provide a splitter knife which is capable of producing consistently smooth kerf surfaces at a lumber feed rate substantially greater than that with splitter knives of prior construction.

A further important object of the present invention is to provide a spliter knife which, although requiring far less frequent sharpenings than splitter knives of prior construction, is capable of being sharpened with speed, facility and precision, thus reducing the time of interrupted production to a practical minimum.

Still another important object of the present invention is to provide a splitter knife which is of economical construction and which is capable of extended use with a minimum of maintenance and repair.

The foregoing and other objects and advantages of this invention will appear from the following detailed description, taken in connection with the accompanying drawing, in which:

Figure 1 is a view in side elevation of a splitter knife embodying the features of the present invention;

Figure 2 is a view in rear end elevation of the splitter knife shown in Figure 1; and

Figure 3 is a top plan view of the splitter knife shown in Figure 1.

The splitter knife of the present invention includes a shank end **10** adapted for attachment to a splitter knife head (not shown), in accordance with conventional practice. Thus, the shank is provided with a transverse elongated opening **12** adapted to receive a securing bolt for releasable attachment to a splitter knife head. One side surface of the shank is provided with serrations **14** which correspond with complementary serrations on the splitter knife head, whereby to provide adjustable but positive interconnection between the splitter knife and the head.

Extending from the shank is the splitter knife blade **16**. The blade is wedge shaped in transverse cross section, being thinner at its trailing edge **18** than at its leading edge. The leading edge is provided with a longitudinal arcuate grove **20** which preferably extends the full length of the blade, whereby to provide laterally spaced cutting edges **22**, **24** defined by the lateral sides of said leading edge.

The outer end of the blade is formed with a pair of offset, substantially parallel edges **26**, **28**. The upper edge **26** extends forwardly from the trailing edge **18** of the blade and the lower edge **28** extends rearwardly from the leading edge of the blade. These offset edges are interconnected by an intermediate arcuate edge **30**, which forms an undercut below the upper edge. Thus, the forward end of the upper edge is formed as a saw tooth **32**. Since the saw tooth projects radially outward beyond the outermost end of the leading edge of the blade, it functions to make the initial cut in a board, as explained more fully hereinafter.

As illustrated in Figure 1 of the drawing, the length of the splitter knife blade is greater than the thickness of a board **34** to be split. The length of the blade preferably is such that the entire outer offset edges **26**, **28** thereof project through the board.

In accordance with the preferred embodiment of the present invention the spaced cutting edges **22**, **24** formed on the leading edge of the blade are parallel for a length at least equal to the thickness of the board to be split, and the lateral sides of the remaining outer portion of the blade to the outer offset edge **28** converge outwardly to reduced thickness. Thus, the outer portions **22'** and

24' of the spaced cutting edges 22, 24 converge outwardly and taper slightly rearward. The convergence and taper preferably are arcuate, as illustrated, since it has been found that an even smoother kerf surface is produced by such arcuate form as compared with a rectilinear taper.

As best shown in Figures 2 and 3, a substantially uniform width is maintained from the outer ends of the cutting edges 22', 24' of the blade rearwardly along the oblique outer edge 28 to a point on the intermediate undercut 30 which corresponds with the maximum cutting circle 36 of the leading edges 22', 24'. The width of the undercut 30 preferably then converges outwardly to the saw tooth edge 32. Since the width at the outer ends of the cutting edges 22', 24' is not substantially greater than the maximum cutting width of the saw tooth, said edges are protected against breaking and premature dulling. The outer oblique edge 26 tapers substantially uniformly rearward from the saw tooth.

Further in accordance with the preferred embodiment of the present invention, the lateral sides of the splitter knife blade are hollow ground in the direction of the trailing and leading edges. This performs the two-fold function of minimizing friction between the blade and the wood being cut, and also facilitates sharpening of the blade with maximum precision and speed.

The operation of the splitter knife of the present invention is as follows: As a board is fed toward the rotating splitter knives mounted at spaced intervals about the circumference of a splitter knife head, the saw tooth 32 first engages the wood and cuts away an initial kerf having a maximum thickness corresponding to the maximum width of the saw tooth projecting beyond the radius 36. The wood is removed in the form of sawdust. The wood adjacent the kerf then is engaged by the outer tapered sections 22', 24' of the spaced cutting edges, whereupon the wood is removed progressively in the form of fine shavings, until the kerf has been widened to the maximum width of the blade defined by the parallel sections of the spaced cutting edges 22, 24. The action of the outer arcuately tapered portions of the spaced cutting edges is similar to a jack plane, whereupon the kerf surfaces thus produced are finished with a smoothness equal to the remaining planed surfaces of the board.

The provision of the outwardly converging spaced cutting edges 22', 24' at the outer end of the splitter knife blade affords the additional advantage of retaining the sharpness of said cutting edges, thereby not only necessitating fewer sharpenings and hence fewer periods of interrupted production, but also extending substantially the useful life of the splitter knife.

It will be apparent to those skilled in the art that various modifications and changes of the structural details described hereinbefore may be made without departing from the scope and spirit of this invention. For example, each of the lateral sides of the outer end of the blade may be tapered on a single rectilinear or arcuate plane. Alternatively the taper may be confined to the area adjacent the edge 28. Still further, the area adjacent the intermediate edge 30 may be tapered from maximum width at the saw tooth edge 32 to minimum width at the juncture with edge 28, it being required however that the width at the saw tooth edge 32 be not substantially greater and preferably less, than the width at the outer ends of the tapered cutting edges 22', 24'. Accordingly, it is to be understood that the foregoing description is primarily illustrative of the invention and is not to be considered as limiting the scope thereof.

The splitter knife of this invention overcomes all of the disadvantages of splitter knives of prior construction. It affords the production of kerf surfaces which are as smooth as can be produced by the best planers, and at a lumber feed rate of more than twice the feed rate heretofore possible with prior splitter knives. A set of the knives is capable of splitting more than ten times the number of board feet of lumber than is possible with a set of knives of prior construction.

Having now described my invention and the manner in which the same may be used, what I claim as new and desire to secure by Letters Patent is:

1. A rotary splitter knife comprising a blade having an elongated leading edge and tapering to reduced thickness at the trailing edge, a saw tooth on the outer end of the blade projecting outwardly beyond the maximum cutting circle of the leading edge and trailing the latter, and laterally spaced cutting edges projecting from the sides of the leading edge in the direction of rotation of the knife, a radially inward portion of the cutting edges being longer than the thickness of a board to be split and the lateral spacing thereof being greater than the cutting width of the saw tooth, the lateral spacing of the cutting edges at their inner working ends being at least equal to the lateral spacing a distance radially outward therefrom at least equal to the thickness of a board to be split, the outward portion of the cutting edges thereby projecting through a board when the blade is perpendicular thereto, the outward portion of the cutting edges converging radially outward to a width not substantially exceeding the cutting width of the saw tooth to provide planing edges which shave the board to full kerf width.

2. The splitter knife of claim 1 wherein said cutting edges are substantially parallel from their inner working ends outward for a distance at least equal to the thickness of a board to be split.

3. The splitter knife of claim 1 wherein the working length of said leading edge is concave across its lateral dimension, thereby defining said laterally spaced radially extending cutting edges.

4. The splitter knife of claim 1 wherein the spaced cutting edges of said outer portion of the blade converge radially and arcuately outward to a terminal width substantially equal to the greatest cutting width of the saw tooth.

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