April 9, 1957 P. LEE 2,788,032

ANTI-KICKBACK WORK FEEDING PUSHER SAW ATTACHMENT

Filed May 5, 1955 2 Sheets-Sheet 1

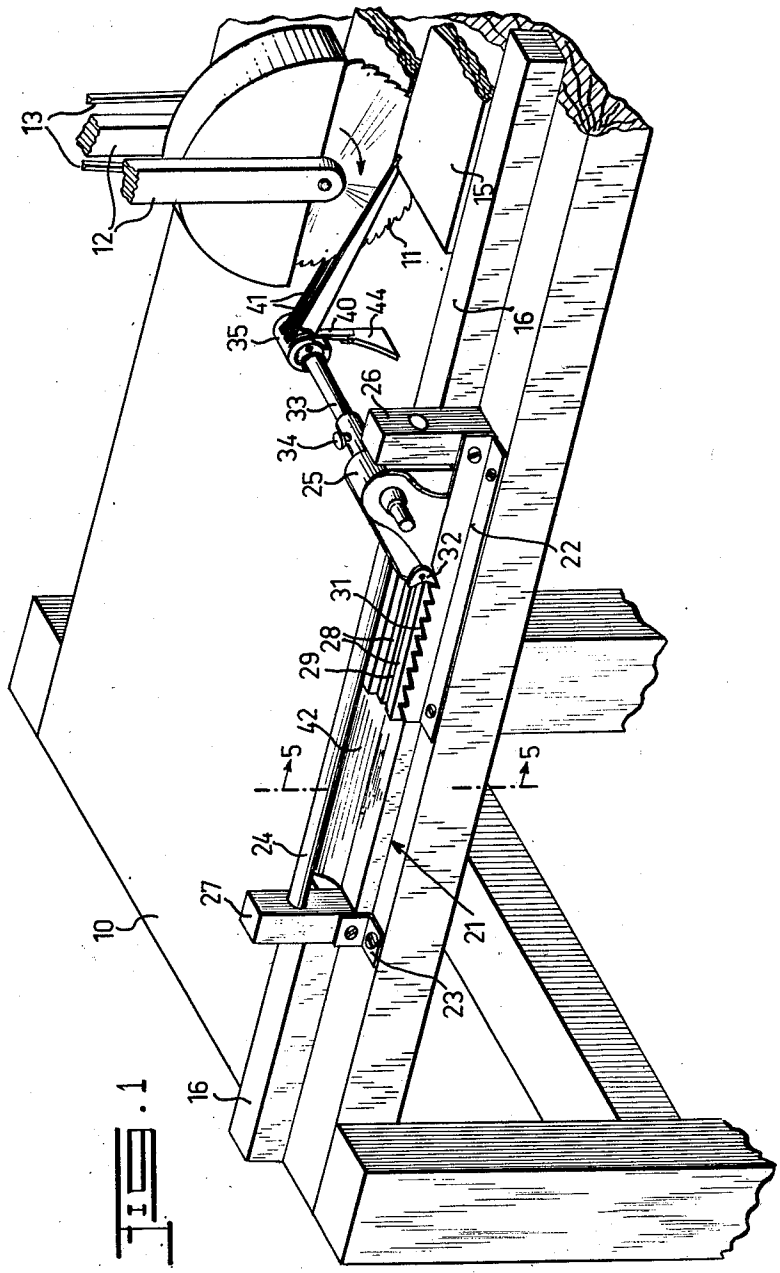


FIG. 1

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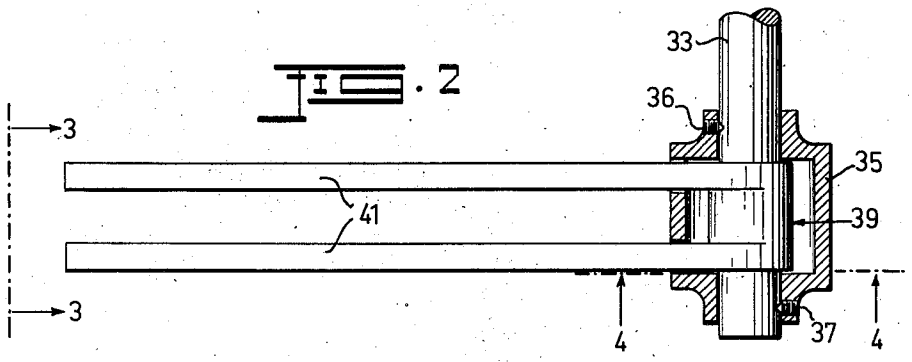


FIG. 2

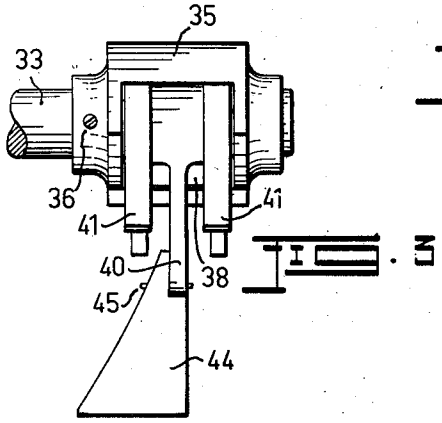


FIG. 3

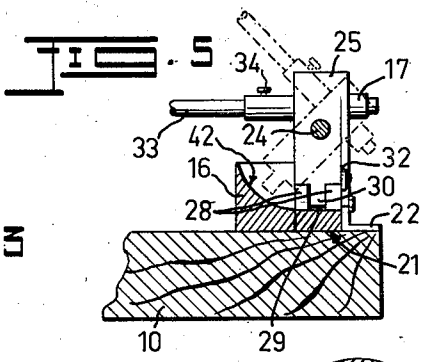


FIG. 5

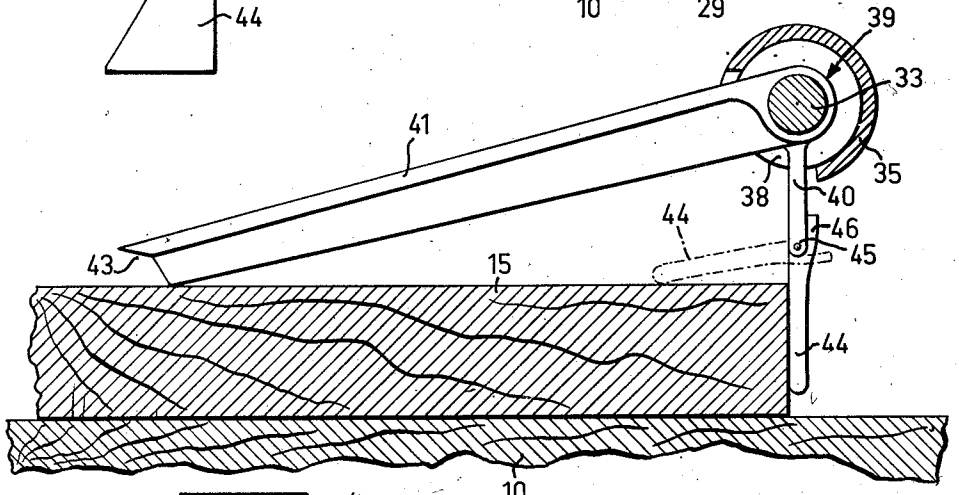


FIG. 4

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ANTI-KICKBACK WORK FEEDING PUSHER SAW ATTACHMENT

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13 Claims. (Cl. 143—51)

My present invention relates to a safety attachment for power-driven table saws, more particularly (but not exclusively) for circular saws of the overhead type.

The feeding of the boards to the blade of an overhead saw in a direction parallel to the grain of the wood, generally termed "ripping," has heretofore been a somewhat hazardous operation, owing to the difficulty of providing a satisfactory finger guard and also because of the tendency of the rotating saw blade to lift the board off the table and to hurl it back against the operator; this kickback action, as is well understood, arises from the fact that the feeding pressure, if exerted upon the board out of line with the blade, tends to close the cut made by the blade whereby the latter becomes wedged between the two flanking board portions and imparts its own motion to the board. Since, for understandable reasons, the operator will be reluctant to put his hands to the board close to the plane of the blade when the latter approaches the end of its travel, this danger of kickback is especially marked at the final stage of the ripping operation when the board portions on either side of the blade are almost completely severed and are thus easily moved toward each other.

The general object of my invention is to provide a safety or anti-kickback attachment for power-driven saws which will avoid the difficulties outlined above.

More particularly, it is an object of my invention to provide an attachment of this character having means for applying pressure to a board at a location extremely close to the plane of the saw blade, especially during the final feeding stage when the board is about to be cut in two.

Another more specific object of my invention is to provide an attachment as set forth above having means for securely intercepting the board in case the latter is kicked back by the blade.

A further specific object of my invention is to provide an attachment for the purpose described which can be readily retracted into an inoperative position when not required.

A feature of my present invention resides in the provision of a bifurcate or two-pronged pusher member adapted to straddle the saw blade, along with means for guiding this member along the plane of the blade, whereby a board engaged by the prongs of the pusher member can be moved past the point at which it is completely bisected by the blade.

Another feature of my present invention resides in the provision of a depending tongue positioned back of the pusher member and preferably rigid therewith to serve as a means for stopping the board after a short backward movement if it happens to disengage itself from the pusher member and to be kicked back by the blade.

A further feature of my present invention resides in a

pivotal mounting for the pusher member enabling the latter to be swung out of and back into operative position without requiring any re-alignment with the saw blade.

The above and other objects, features and advantages of my invention will become more fully apparent from the following detailed description of a specific embodiment, reference being had to the accompanying drawing in which:

Fig. 1 is an isometric view of part of an overhead saw equipped with an attachment according to the invention;

Fig. 2 is a greatly enlarged top plan view, partly in section, of the pusher member forming part of the attachment of Fig. 1;

Fig. 3 is an end view taken on the line 3—3 of Fig. 2;

Fig. 4 is a side elevational view of the pusher member, partly in section on the line 4—4 of Fig. 2; and

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 1.

Above the table 10 a blade 11 is mounted on an overhead support comprising a pair of arms 12; motion is imparted to the blade from a suitable motor, not shown, by means of a belt 13, the blade turning clockwise as indicated by the arrow. Blade 11 can be shifted across table 10 to cut strips of different width from a board 15, this board being guided along a rail 16 which extends parallel to the plane of the blade.

In accordance with my invention there is positioned alongside the rail 16 a frame 21 secured to the table 10 by means of angle irons 22 and 23. Frame 21 supports a horizontal guide rod 24 extending parallel to rail 16 and traversing a head 25 which is slidable thereon between the end posts 26, 27 of the frame. Frame 21 is provided, over part of its length, with two spaced ledges 28 defining between them a groove 29; a spur 30 from head 25 projects into this groove as seen in Fig. 5. Angle iron 22, which terminates flush with the ledges 28, is provided with a set of sawtooth-shaped ratchet teeth 31 co-operating with a pawl 32 carried on head 25.

Head 25 is also traversed by a horizontal shaft 33 which passes through a sleeve 17 at right angles to rod 24 and thus stands perpendicular to the plane of blade 11. One end of this shaft is secured to sleeve 17, rigid with head 25, by means of a screw 34; its other end carries a sleeve 35 which is fixed to it by set screws 36, 37 and has a recess 38 accommodating a bell crank lever 39. This lever, pivoted on shaft 33, comprises a depending arm 40 and a bifurcate arm 41, roughly at right angles thereto, whose two prongs are positioned to straddle the blade 11 when the head 25 is moved toward post 26. It will be noted that this post is disposed sufficiently ahead of blade 11 to prevent the latter from coming into contact with sleeve 35; under these circumstances it is necessary for arm 41 to have a length approximately equal to or preferably greater than the radius of the saw blade in order to enable it to push the board 15 past the nadir of the blade. Arm 40 has a tongue 44 pivoted to it at 45 and provided with an extension 46 which serves to brace tongue 44 against arm 40 when a board 15 presses upon it as shown in Fig .4.

The members 22 and 23 are sufficiently foreshortened with respect to frame 21 to leave a clearance adapted to receive the head 25 whereby the latter may be swung around rod 24 so as to remove shaft 33 and bell crank lever 39 from their operative position, shown in Figs. 1 and 4, into a retracted position away from the operating surface of table 10. To facilitate this movement, rail 16 is cut out along part of a cylinder surface 42, as best seen in Fig. 5, to clear the spur 30 when the head 25 is swung out as illustrated in dot-dash lines.

In operation, the safety attachment **33**, **35**, **39** is first adjusted by means of screw **34** to align arm **41** with blade **11**. Tongue **44**, pivoting about pin **45**, enables a board **15** to be fed to the blade **11** in the normal manner. After the rear edge of the board has passed a sufficient distance beyond the post **27** of frame **21** to clear the prongs or pusher fingers **41**, the latter are caused to engage this rear edge by means of their angularly undercut extremities **43** (Fig. 4) as seen in Fig. 1. The operator, bearing with his right hand upon head **25**, advances the latter along rod **23**, thereby exerting pressure upon the board **15** while keeping his left hand free to guide the board properly along rail **16**. As the prongs **41** approach further toward blade **11**, spur **39** enters groove **29** (which for this purpose may be slightly flared at its entrance end) for positive guidance of the carriage **25**, **33**, **35**; at the same time, pawl **32** engages rack portion **31** of angle iron **22**, whereby any reversal of the movement of the carriage due to kickback will be prevented.

Should violent action of the blade **11** disengage the board **15** from extremity **43** of lever arm **41**, the board, after being thrown back by a distance equal to the length of this lever arm, will strike the arm **40**, **44** of lever **39** and will be prevented from further backward movement inasmuch as arm **41**, having come to rest upon the surface of the board as illustrated in Fig. 4, stops the counterclockwise rotation (as viewed in this figure) of lever **39** under the impact of the board. The operator may then stop the saw and re-engage the board **15** with lever extremity **43** to complete the cut.

The invention is, of course, not limited to the specific embodiment described and illustrated but may be realized in a variety of modifications and adaptations without departing from the spirit and scope of the appended claims.

I claim:

1. A safety attachment for power-driven saws in which an operating surface is provided with means for directing the advance of a board or the like toward a saw blade, said attachment comprising a pusher member having a pair of prongs adapted to straddle the saw blade, a support for said pusher member, and guide means engaging said support for movement in the direction of advance of the board, said support and said guide means being provided with co-operating pawl-and-ratchet means locking said pusher member against movement away from said saw blade.

2. A safety attachment for power-driven saws in which an operating surface is provided with an elongated rail parallel to the plane of a saw blade for directing the advance of a board or the like toward said blade, said attachment comprising a pusher member having a pair of prongs adapted to straddle the saw blade, a movable support for said pusher member, and guide means including an elongated frame positioned alongside said rail in engagement with said support for guiding the latter in the direction of advance of the board, said frame being provided with rack teeth over at least part of its length, said support being provided with a pawl co-operating with said rack teeth for preventing a movement of said support on said frame in a direction away from the saw blade.

3. A safety attachment for power-driven saws in which an operating surface is provided with an elongated rail parallel to the plane of a saw blade for directing the advance of a board or the like toward said blade, said attachment comprising a pusher member having a pair of prongs adapted to straddle the saw blade, a movable support for said pusher member, and guide means including an elongated frame positioned alongside said rail in engagement with said support for guiding the latter in the direction of advance of the board, said frame being provided with an elongated groove over part of its length, said support being provided with a projection disengageably fitting in said groove, said guide means further including an elongated rod on said frame traversing said support and extending parallel to the plane of the saw blade, said support being pivotable about said rod upon disengagement of said projection from said groove.

4. An attachment according to claim 3, wherein said rail is provided with a cutout accommodating said projection during pivotal movement of said support.

5. A safety attachment for power-driven saws, comprising a carriage, guide means for said carriage enabling movement thereof toward a saw blade, pawl-and-ratchet means on said guide means and on said carriage locking the latter against reverse movement, and a pusher member mounted on said carriage, said carriage being provided with a substantially horizontal shaft, said pusher member comprising a bell crank lever pivoted on said shaft and having a depending first arm and a second arm extending roughly at right angles to said first arm, said second arm having an undercut extremity shaped for engagement with an edge of a board to be cut.

6. An attachment according to claim 5, wherein said second arm is bifurcate and adapted to straddle a saw blade.

7. An attachment according to claim 6, wherein said first arm is positioned between the prongs of the bifurcate second arm.

8. In a power saw, in combination, a saw table, a circular saw blade extending at least partly above said table, an elongated guide rail on said table extending parallel to the plane of said blade, an elongated rod extending parallel to the plane of said table and to the plane of said saw blade, a carriage movably guided along said rod, a bifurcate pusher member adapted to straddle said blade, said member being secured to said carriage in alignment with said blade, said carriage being provided with guide means limiting it to rectilinear motion along a part of said rod relatively close to said blade while enabling swinging movement of said carriage about said rod in a position relatively remote from said blade, rack means on said table substantially co-extensive with said relatively close rod part, and pawl means on said carriage co-operating with said rack means for preventing movement of said carriage in a direction away from said blade.

9. The combination according to claim 8, wherein said pusher member is mounted on said carriage above said table for swinging movement in the plane of said blade, further comprising a stop member rigid with said pusher member and extending toward the surface of said table roughly at right angles to said pusher member.

10. The combination according to claim 9, wherein said stop member is provided with an extension hingedly connected with it and having bracing means for consolidating said stop member and said extension in response to pressure from the direction of said blade, said extension being adapted to lift for the passage of a board between it and said table toward said blade.

11. In a power saw, in combination, a saw table, a circular saw blade extending at least partly above said table, an elongated guide rail on said table extending parallel to the plane of said blade, a carriage movable on said table in a direction parallel to said plane, guide mens for said carriage on said table adjacent said rail, said carriage including a shaft transverse to said plane, and a pusher member pivotally mounted on said shaft, said pusher member including a pair of prongs adapted to straddle the saw blade and further including a depending stop member rigid with said prongs and extending roughly at right angles thereto substantially in the plane of said blade, said guide means being adapted to limit the travel of said support in a direction away from said blade.

12. The combination according to claim 11, wherein said stop member comprises an arm provided with a

depending extension hingedly connected with it, said extension having bracing means for consolidating said arm and said extension in response to pressure from the direction of said blade, said extension being adapted to lift for the passage of a board between it and said table toward said blade.

13. The combination according to claim 11, wherein said prongs have a length at least equal to substantially the radius of said saw blade.

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