United States Patent

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[54] CUTTING HEAD FOR PROFILE CHIPPING OF LOGS

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.** **B27c 1/08**

[58] **Field of Search** 144/220, 218, 162, 176, 118

[56] **References Cited**

UNITED STATES PATENTS

23,870	5/1859	Smith	144/118
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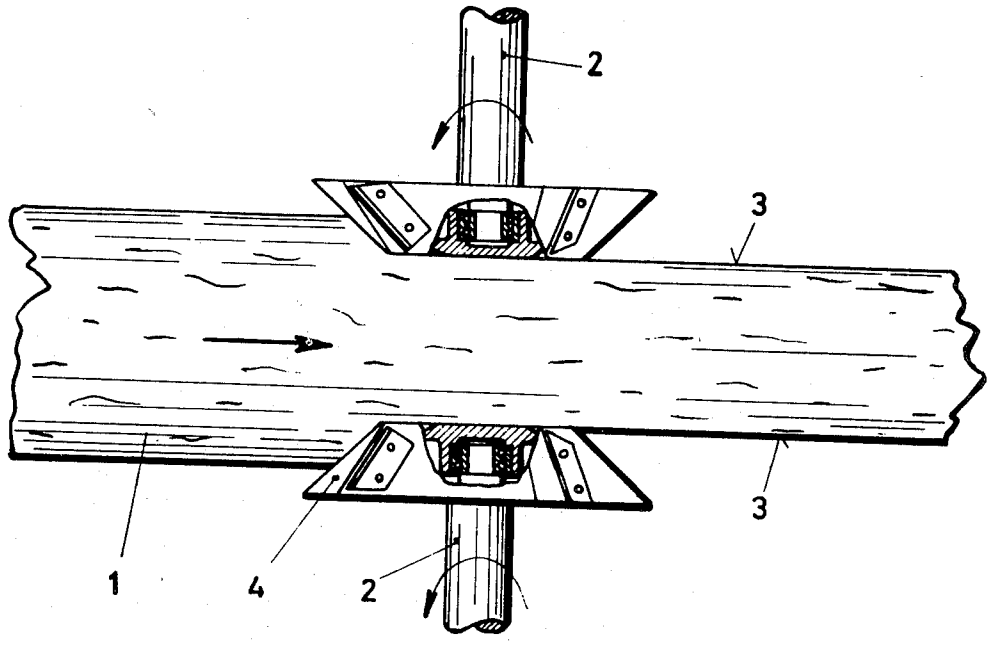
[57] **ABSTRACT**

In a rotary cutting head for chipping longitudinally moving logs by engagement on the side of a log with the rotary axis of the cutterhead extending transversely to the logs; a log support member mounted within the cutting head for free rotation relative to the head and for engagement against the surface of the log to reduce the friction between the support member and the log.

2 Claims, 2 Drawing Figures



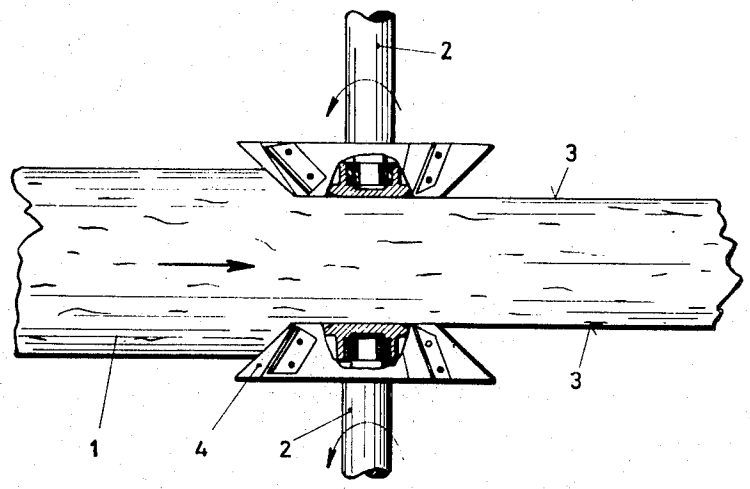


FIG. 1

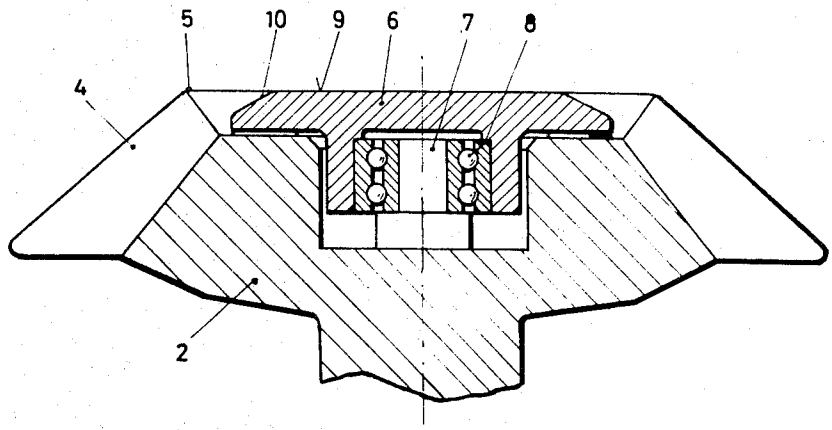


FIG. 2

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CUTTING HEAD FOR PROFILE CHIPPING OF LOGS

SUMMARY OF OBJECTS AND INVENTIONS

The invention concerns a cutting head for the profile chipping of logs wherein the rotational axis of the cutting head extends transverse to the chipped surface. More specifically the present invention relates to such a cutting head having a novel log support surface mounted on its face for rotation relative to the cutting head for reducing friction between the cutting head and the log.

In so-called profile chipping, a square beam is often produced from round timber, during which the removed lateral segments of the logs are converted directly into high-grade useful particles of chips. Customarily, in the first phase of the process, two lateral segments of the log are chipped by two opposing cutting heads, between which the log is guided, in such a manner that a so-called "model" piece develops with two surfaces opposing each other in parallel. After a second pass through the cutting heads, two additional surfaces are produced which for example, extend perpendicularly to the first surfaces, whereby the removed lateral segments of the "-piece" are likewise converted into high-grade useful particles or chips.

Cutting heads for profile chipping of round timber have been known to be mounted with their rotational axes running perpendicularly to the chipped surface while including a log-supporting surface which engages the chipped surface. The supporting surface is supposed to support the timber immediately after the chipping process and to guide it between the cutting heads opposing each other. In prior art cutting heads, this supporting surface is formed by a circular front surface of the body of the cutting head itself.

However the prior art supporting surface has the disadvantage that it turns together with the cutting head and therefore results in a relative speed between the supporting surface and chipped surface of the timber which speed is still considerably higher and in addition to the speed of the longitudinal movement of the timber along the cutting head. Since the cutting speeds in the case of woodworking machines are very high, as is well known, this relative speed between the supporting surface and the chipped surface is so high, that the resulting friction will cause burning of the timber at points engaged by the supporting surface. Consequently the surface of the sawed timber produced is impaired, which leads to a lowering of the quality of the lumber produced.

It is therefore an object of the present invention to provide a novel cutting head equipped with a log-supporting surface such as to overcome the aforementioned disadvantages of the prior art cutting heads while at the same time providing effective support for the timber after chipping.

A further object of the present invention is to provide a novel method of supporting a longitudinally traveling log during chipping by a rotary cutting head which cuts into the side of the log.

According to one embodiment of the invention the above objects are achieved by a supporting surface formed as a disk mounted freely rotatably in the cutting head. Because of the freely rotatable mounting of the disk, it does not revolve together with the cutting head, but is free to revolve at a lesser speed or to remain still, so that very slight friction will result between the supporting surface and the wood. For example, the supporting surface is at a standstill whenever the chipped timber is guided past it axially. In that case the relative movement between the supporting surface and the chipped surface is limited to a minimum value, namely to the speed of feed of the timber. Regularly this speed is so low that the surface of the wood is practically not impaired.

According to one embodiment of the invention, the supporting surface, for practical purposes, is a closed circular surface. As a result the greatest possible contact surface is realized between the disk and the wood and, besides that, the central area of the cutting head is completely covered so that impairments are practically impossible as a result of chips and similar things piling up. However, the supporting surface can also be an annular surface, for example if a decreased contact surface between the support and the wood will provide sufficient support.

Further according to the invention, the outside peripheral edge of the supporting surface is preferably rounded to remove sharp edges so that the chipped surface of the wood will easily run along the supporting surface and impairment of the chipped surface will be prevented. In order to further facilitate the wood gliding along the supporting surface, the latter may also be formed in the shape of a flat cone on its outside periphery. Among other advantages, this will be advantageous in that the wood, even in the case of a slightly inclined position relative to the disk, will not come into contact with the edge of the disk but will glide along it without any significant resistance; and any wood splinters which possibly might protrude will not get caught behind the disk. According to the invention, it will also be of an advantage to make the supporting surface spherical (curved convexly) or as a flat cone. In this instance, the surface pressure of the supporting surface will increase gradually from the edge toward the middle of the support so that the wood will glide along it without any significant resistance while avoiding contact with the edge of the disk.

The chipping knives, according to the invention, can consist in each instance of a scoring knife, which essentially bucks transversely in relation to the direction of the wood fibers, and a separating knife or planing knife, which cuts in parallel to the direction of the fiber and which separates the chip in the width in which the scoring knife has bucked. In this case, particularly even chips of high quality can be produced because, as a result of the precise guidance of the wood, one can achieve a certain depth of cut and thickness of the chip which remain exactly the same. Besides that, the separation into scoring and separating knives will decrease the axial components of the cutting force on the wood, so that the load on the freely revolving support disks is lowered and thus an easier guidance of the wood will be achieved.

Further characteristics, advantages and objects of the invention will become apparent from the attached drawings presented by way of example, as well as from the following detailed description.

In the drawings:

FIG. 1 is a plan view illustrating a round timber longitudinally moving between two cutting heads embodying the invention, with certain portions of the cutting heads removed to show associated supporting discs.

FIG. 2 is an enlarged cross-sectional view of one of the cutting heads taken along a diametrical plane.

Referring now to the drawings in detail FIG. 1 shows a round timber 1 moving longitudinally between two cutting heads 2 embodying the invention of a profile-chipping machine (not shown) during which two lateral segments of the timber are chipped in such a manner that two chipped surfaces 3 will develop on the round timber 1, which surfaces 3 run in parallel to one another. Cutting heads 2 carry chipping knives 4 whose foremost edges 5 produce the surfaces 3. The rotational axes of the cutting heads 2 in this case run perpendicularly to the chipped surfaces 3. The chipping knives according to the invention can consist each time of a scoring knife, which bucks essentially transversely to the direction of the wood fibers, and a separating knife or planing knife, which cuts in parallel to the direction of the fibers and which separates the chip in the width in which the scoring knife had bucked—a similar arrangement is shown for example in U.S. Pat. No. 3,360,024 issued to the assignee of the present application.

In the center of the cutting head 2, a disk 6 is mounted freely rotatably relative to the head 2. The cutting head 2 has a middle peg 7 which carries the disk 6 via a bearing, in the embodiment shown by way of example, a double file, grooved ball bearing 8 leading in an axial and radial direction. The frontal surface 9 of the disk 6 in an axial direction is essentially

at the same level with the leading edges 5 of the chipping knife 4. The front surface 9 of the disk 6 constitutes a supporting surface for the round timber which it engages at the chipped surface 3. The supporting surface is shown as a flat cone 10 at the outside periphery of the disk 6, which cone makes possible an easier gliding of disk 6 along the chipped surfaces 3.

As stated above, other shapes may be employed on the support disc. Although the rotary axis of the cutting heads and the support discs has been illustrated as perpendicular to the axis of the log, other orientations may be employed in carrying out the present invention. Moreover other knife arrangements may be employed on the cutting head in carrying out the log support concept of the present invention.

I claim:

1. A rotary cutting head for profile cutting of logs or similar members, comprising in combination, a body having a number of knives thereon for rotation with the body to cut pieces from a log, a support member for engaging a surface of the log for supporting said log during cutting by the knives, and means rotatably mounting said support member within said body for rotation about an axis coincident with the rotational axis of said body such that said body rotates relative to said support member during cutting so as to reduce friction between the support member and the surface of the log being cut, said means preventing axial movement of said support member into said body to maintain proper supporting engagement with the log being cut, said means including a ball bearing positioned between the body and said support member, said ball bearing including an inner race fixed directly to said body and an outer race fixed to said support member, said support member being relieved at peripheral portions thereof to facilitate movement of a log across the support member while preventing obstructing engagement between the log and peripheral portions of said support member.

2. Apparatus for cutting pieces from a log moving longitudinally in a horizontal path, the apparatus comprising in combination, at least two opposed cutterheads mounted on opposite sides of the path of movement of the log for rotation about generally horizontal axes to engage and cut into opposite sides of the log as it moves along said path, said cutter heads each including a body having a number of knives thereon for rotation with the body to cut pieces from a log as the log moves along said path, and a support member for engaging and supporting the log during cutting by the knives as the log moves along said path, said support member being mounted within said body for rotation relative to said body about an axis coincident with the axis of rotation of said body.

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