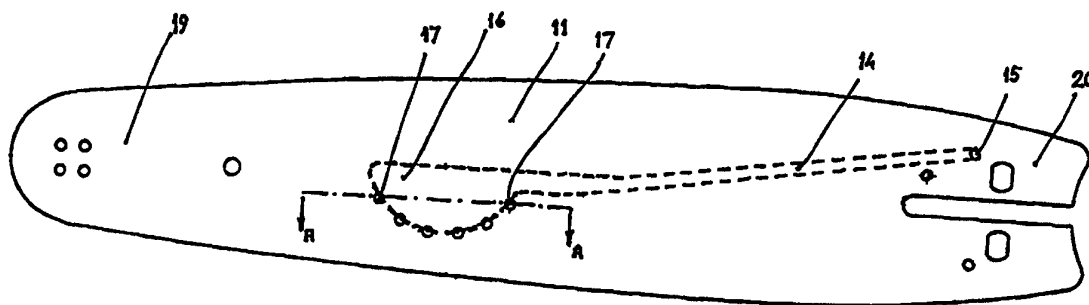




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/SE95/00692 (22) International Filing Date: 9 June 1995 (09.06.95) (30) Priority Data: 9402426-2 11 July 1994 (11.07.94) SE (71) Applicant (for all designated States except US): SANDVIK AB [SE/SE]; S-811 81 Sandviken (SE). (72) Inventor; and (75) Inventor/Applicant (for US only): LEINI, Arvo [SE/SE]; Granvägen 1, S-828 00 Edsbyn (SE). (74) Agent: SUNDSTRÖM, Erik; Sandvik AB, Patent Dept., S-811 81 Sandviken (SE).</p>		<p>(81) Designated States: CA, FI, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  Published With international search report.</p>

(54) Title: CHAIN SAW GUIDE BAR WITH LIQUID SPRAY DEVICE



(57) Abstract

Chain saw guide bar and method of using a guide bar for spraying liquid on a sawn surface through a plurality of orifices (17) in at least one sideplate (11) of the guide bar, where at least some of the orifices give the sprayed liquid velocity components in directions along the guide bar, said velocity components depending on the liquid pressure which can be controlled to decide the extent of the sprayed surface.

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CHAIN SAW GUIDE BAR WITH LIQUID SPRAY DEVICEBackground

5 It is previously known that chain saw guide bars can be provided with channels and orifices to spray the sawn surface with liquid, such as paint for colour coding or fungicide as described in patent SE 7611822-3, or both. Such guide bars are commonly used on vehicle-born chain saws.

10 For colour coding it is important to get distinct markings, and each liquid channel then has generally just one orifice. For spraying fungicide, it is important to cover a major part of the sawn surface, but at the same time not to spray outside that surface, which would constitute excessive waste  
15 of liquid and an environmental hazard.

In patent US 5,143,131 was described a guide bar design where the liquid channel has a multitude of orifices, all of which need not be open simultaneously. The choice of which  
20 orifices are to be open is regulated with slideable metal strips with orifices forming a different pattern from the orifices in the sideplate of the guide bar. The strips are moved with an external device, such as a hydraulic actuator on the underside of the guide bar, until the desired number  
25 of orifices coincide between the strip and the sideplate. Such a device is vulnerable, however, due to the slideable strips and the unprotected location of the hydraulic actuator. It is also difficult to have a reliable indication at the operator's cab of how large a surface is  
30 being sprayed.

The present invention concerns a chain saw guide bar for fungicide spraying, where the extent of the sprayed area can be varied in relation to the size of the sawn surface,  
35 without small movable parts and without actuators at the guide bar, and where it is simple to indicate for the operator how large an area is sprayed.

Description

A guide bar according to the invention is provided with orifices which give the liquid a velocity component along the plane of the guide bar, not only vertical to the plane. Such orifices are described in the patent SE 9300180-8, where they were utilized to make liquid spray from orifices near the bar centerline hit the cut surface close to the edge of the bar, to allow return of the bar as soon as the saw chain has fully penetrated the tree trunk, with a smaller angular movement than otherwise. According to that patent the liquid is given a velocity component across the bar from the centerline towards the edge.

In a guide bar according to invention, a plurality of orifices are located to give the liquid a velocity component parallel to the bar centerline. The size of this velocity component and thus the width of the sprayed area measured along the bar depends on the liquid pressure in the channels of the bar before the orifices.

The orifices are located adjacent to a pressure equalizing chamber in the guide bar, to make the spray velocity independent of the liquid flow within the channels. By measuring the liquid pressure at a pump or pressure vessel in the operator's cab, the operator can judge the width of the sprayed area. The spraying occurs during angular motion of the bar while sawing, and the pressure may be automatically controlled in relation to the position of the gripping arms of the machine holding the tree, this position indicating the diameter of the tree.

A guide bar with spray orifices in one sideplate according to the invention is shown in figure 1 in a view from below, and in figure 2 as a cross section through the pressure equalizing chamber. If desired, the bar can be made reversible and symmetrical with two pressure chambers and orifices in both sideplates.

The guide bar comprises two sideplates (11,12) and one center plate (13) joined by welding, brazing or adhesive. A liquid channel (14) is made as a cut-out in the center plate (13) to convey the liquid from a supply hole (15) near the clamping end (20) of the guide bar to a pressure equalizing chamber (16) with a larger cross section than the channel (14). This makes the velocity of the liquid within the chamber (16) much lower than in the channel (14). The spray velocity from all orifices is then equal, and dependent only on the pressure.

In the sideplate (11) there are orifices (17). Only a minor part (18) of the area along the edge of each orifice overlaps the pressure equalizing chamber (16). The orifices are large enough to be blanked in the same operation as the sideplate contour. The pressure equalizing chamber (16) has a convex contour facing the guide bar edge. This orients the overlapping parts of the orifices in such directions, that liquid sprayed from the orifices closest to the guide bar nose (19) has a velocity component towards the nose, and liquid sprayed from the orifices closest to the clamping end (20) has a velocity component towards the clamping end. An equivalent effect can also be achieved by drilling smaller orifices obliquely through through the sideplates, but this is more difficult and liable to clog.

With low liquid pressure the spray will not reach far outside the width of the chamber (16) and the liquid quantity will be limited. With a high liquid pressure the spray will reach a wider area and the liquid consumption will be higher.

The liquids used to protect the sawn surfaces, primarily the remaining stumps, from fungal infection, is either chemicals such as urea, or water suspensions of spores of harmless  
5 fungi which are antagonists or competitors to the harmful fungi. Pigments may be added to verify the liquid flow and to mark which surfaces have been treated.

CLAIMS

1. Guide bar for vehicle-born chain saws, comprising two sideplates (11,12) and a center plate (13), with means for spraying liquid on the sawn surface through a plurality of orifices (17) in at least one sideplate (11), where the liquid is conveyed through a cut-out in the center plate (13) from a supply hole (15) near the clamping end (20) of the guide bar, characterized by at least some of the orifices (17) being made to give the sprayed liquid velocity components in directions along the guide bar.
2. Guide bar according to claim 1, characterized by the cut-out comprising a pressure equalizing chamber (16) adjoining the orifices (17), and a channel (14) connecting the chamber to a supply hole (15), where the chamber (16) has larger cross section than the channel (14).
3. Guide bar according to claim 2, characterized by at least those orifices (17) giving the liquid velocity components along the guide bar overlapping the chamber (16) with only a minor part (18) of the area along their edge.
4. Guide bar according to claim 3, characterized by all orifices (17) overlapping the chamber (16) with only a minor part (18) of the area along their edge, giving the sprayed liquid velocity components in the plane of the sideplate, and the chamber having a convex contour facing the leading guide bar edge.
5. Guide bar according to claim 2, characterized by the guide bar having two chambers, two channels and orifices in both sideplates.
6. Method for spraying liquid on a surface sawn by a vehicle-born chain saw, characterized by supplying the liquid to the guide bar of the chain saw with a controlled liquid pressure, said guide bar being provided with a plurality of orifices (17) in at least one sideplate (11), at least some of said orifices giving the sprayed liquid velocity components in directions along the guide bar.
7. Method according to claim 6, characterized by

controlling the liquid pressure to a value in proportion to the diameter of the tree to be sawn.

8. Method according to claim 7, characterized by measuring the diameter of the tree with measuring means on clamping means holding the tree, and adjusting the liquid pressure in proportion to the diameter.

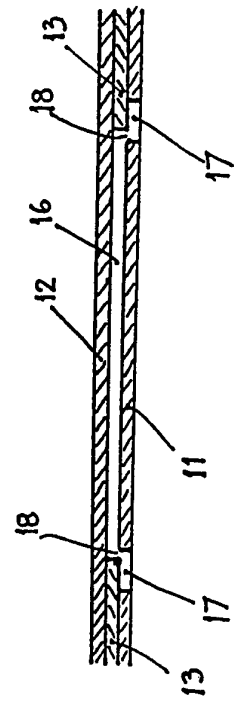
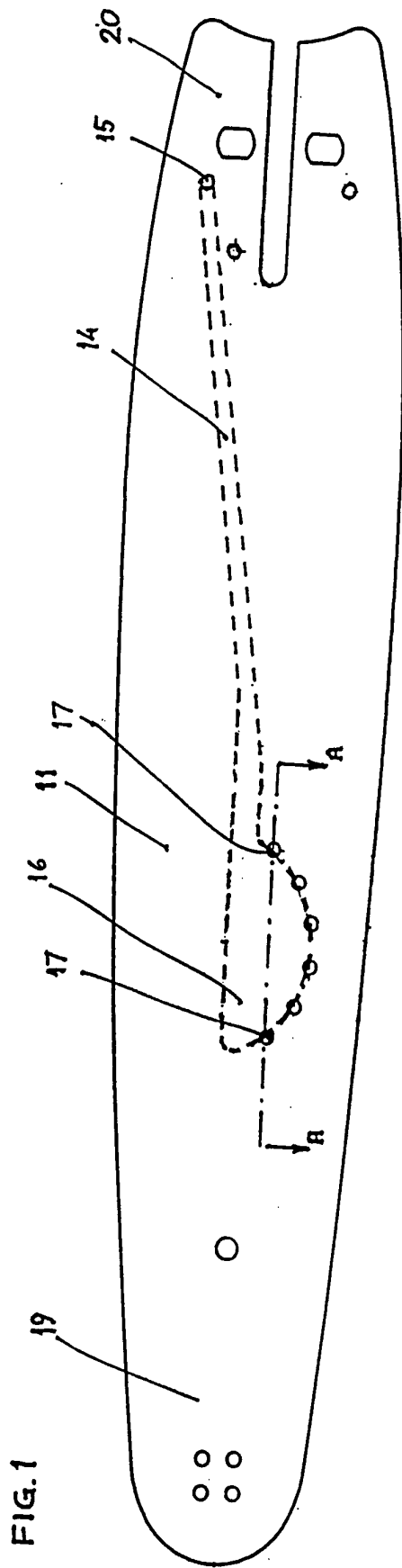


FIG. 1

FIG. 2

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE 95/00692

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC6: B27B 17/00, A01G 23/08 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols)		
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
QUESTEL		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5050303 A (SINCLAIR ET AL.), 24 Sept 1991 (24.09.91)	1,6,7
A	--	3-5,8
Y	US 5143131 A (SEIGNEUR ET AL.), 1 Sept 1992 (01.09.92)	1,6,7
A	--	3-5,8
Y	FI 91208 B (KETONEN, LAURI KALERVO), 28 February 1994 (28.02.94)	1,6,7
A	--	3-5,8
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18 October 1995		23.10.95
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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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**INTERNATIONAL SEARCH REPORT**  
 Information on patent family members

02/10/95

International application No.  
 PCT/SE 95/00692

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US-A- 5143131	01/09/92	AU-A- 1126092	29/04/93
FI-B- 91208	28/02/94	NONE	
SE-B- 469974	18/10/93	AU-A- 4946290	13/08/90
		EP-A- 0462974	02/01/92
		SE-A- 8900170	18/01/89
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		WO-A- 9007870	26/07/90
SE-A- 7611822	25/04/78	NONE	
WO-A1- 9416867	04/08/94	NONE	