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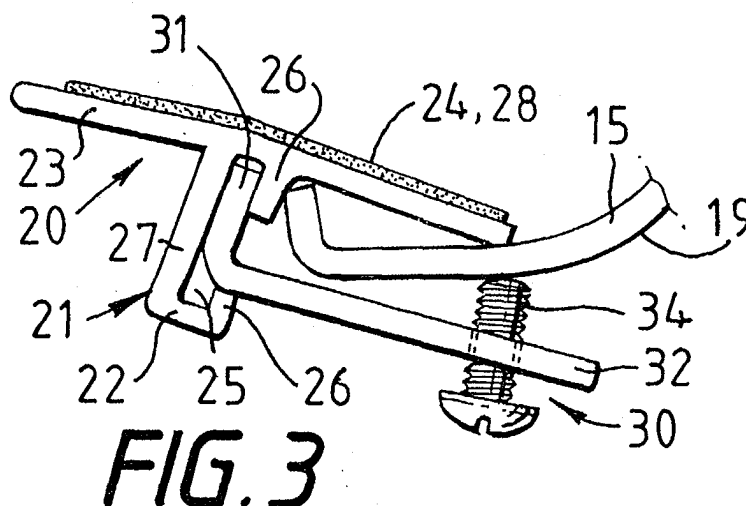
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(54) **Sharpener for rotary lawn mower blades**

(57) A sharpening attachment (20) for a lawnmower (10) of the cylinder type and having a bottom blade (15) of substantially J-shaped cross-section (Fig 2). The sharpening attachment (20) comprises an elongate strip (24) having a surface provided with abrasive material (28), a bracket member (21) to extend the axial length of the lawnmower's helical blades (12) and to support said elongate strip (24), and releasable fastening means

(30-34) to secure the bracket member (21) to the bottom fixed blade (15) of said lawnmower (10) such that the abrasive material (28) of said elongate strip (24), when the latter is supported by the bracket member (21), can lie generally tangential to the cylindrical path traversed by the helical blades (12) and be sequentially engaged by the said helical blades (12) as the latter are rotated thereby to sharpen the said helical blades (12).



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## Description

### Technical Field

**[0001]** This invention relates to sharpening means, and in particular to sharpening means for attachment to a lawnmower of the cylinder type.

### Background

**[0002]** Lawnmowers of the cylinder type generally comprise helical blades mounted in a cylindrical configuration for rotation on the helix axis and co-operable with a fixed bottom blade of the lawnmower for cutting the grass.

**[0003]** One kind of sharpening attachment for such lawnmowers, which is hereinafter referred to as "a sharpening attachment of the kind defined", comprises an elongate strip having a surface provided with abrasive material, a bracket member to extend the axial length of the lawnmower's helical blades and to support said elongate strip, and releasable fastening means to secure the bracket member to the bottom fixed blade of said lawnmower such that the abrasive material of said elongate strip, when the latter is supported by the bracket member, can lie generally tangential to the cylindrical path traversed by the helical blades and be sequentially engaged by the said helical blades as the latter are rotated thereby to sharpen the said helical blades.

**[0004]** Examples of sharpening attachments of the kind defined are known from, for example, GB-1588045, GB-1588046 and GB-2029736. Though eminently suited to a lawnmower of this type provided with a flat fixed bottom blade (i.e. of rectangular transverse cross-section), the said defined kind of sharpening attachment is less suited to a newer form of cylinder lawnmower that has a fixed bottom blade of substantially J-shaped transverse cross-section.

**[0005]** This unsuitability arises from the difficulty of providing for the releasable fastening means to firmly and securely locate the bracket member to a bottom fixed blade of substantially J-shaped transverse cross-section.

### Summary of the Invention

**[0006]** It is an object of the present invention to provide, for a lawnmower of the cylinder type, a sharpening attachment of the kind defined that can be successfully mounted upon a lawnmower's bottom blade of the newer J-shaped cross-section, and be securely located thereon such as to provide for accurate sharpening of the lawnmower's helical blades. Optionally, for use with older and newer lawnmowers, it should also be mountable on a bottom blade of rectangular transverse cross-section.

**[0007]** According to this invention there is provided, for a lawnmower of the cylinder type and having a bot-

tom blade of substantially J-shaped cross-section, a sharpening attachment of the kind defined characterised in that said bracket member is of generally T-shaped transverse cross-section having a web part and a cross-piece extending to each side of one end of the web part, the cross-piece being to support said elongate strip and the web part being formed as a channel of generally C-shaped cross-section with ends of the "C" directed towards one another, and in that said releasable fastening means comprises at least one holding member having a first limb to engage in said channel and a second limb, longer than the first, to extend over the lawnmower's bottom blade, said second limb having a threaded aperture therein to receive in threaded engagement a screw-threaded fastening member that in use engages the lawnmower's bottom blade such that, with the holding member engaged in the channel of said web part, the bracket member may be clampingly fastened to the bottom blade. Preferably the sharpening attachment is also capable of being attached to a bottom blade of rectangular transverse cross-section.

**[0008]** The holding member may be of generally L-shaped cross-section whereby said first limb engages in one half of the generally C-shaped cross-section channel, or may be of generally T-shaped cross section whereby said first limb has two parts (constituting the cross-piece of the "T") that extend in opposite directions and engage in the two opposite halves of the generally C-shaped cross-section channel.

**[0009]** Preferably two such holding members are provided that are slidable longitudinally of the channel to be longitudinally spaced apart in use.

**[0010]** Preferably the elongate strip is removably mountable on the cross-piece of said bracket member.

**[0011]** Preferably the elongate strip is a flexible strip having a coating of abrasive material on one surface (the surface aforesaid), and an opposite surface coated with adhesive.

**[0012]** Advantageously the cross-piece comprises two elongate strip-like surfaces mutually inclined to one another by less than 180° (e.g. at an angle of the order of 170°).

### Brief Description of the Drawings

**[0013]** By way of example, embodiments of this invention will now be described with reference to the accompanying drawings of which:

- Figure 1 is a schematic perspective view showing the underneath parts of a lawnmower of the cylinder type,
- Figure 2 shows at A, B and C in transverse cross-section, alternative forms for a bottom blade of a lawnmower such as that of Fig 1,
- Figure 3 is a schematic side view of sharpening means embodying the present invention mounted on a bottom blade such as one

shown in Fig 2, and  
 Figure 4 is a side view of parts of the sharpening device of Fig 3 but in somewhat a modified form.

#### Detailed Description of Examples) of the Invention

**[0014]** The lawnmower 10 of Fig 1 is of the cylinder type and comprises a plurality of helical blades 12 mounted in a cylindrical configuration for rotation on the helix axis defined by an axle or spindle 14 and co-operable with a fixed bottom blade to effect cutting of the lawn grass. The bottom blade 15 of Fig 1 is flat and of rectangular transverse cross-section. Alternative forms of bottom blade 15 each of substantially J-shaped transverse cross-section, are shown in Figs 2A, 2B and 2C respectively.

**[0015]** As illustrated in Figure 3, the sharpening means 20 comprises a bracket member 21 of somewhat T-shaped cross-section having a web part 22 and an upper limb or cross-piece 23 extending to each side of one end of the web part 22. The length of bracket member 21 is at least equal to the axial length of the cutting blades 12 of the cylinder 10. The cross-piece 23 is provided with two elongate strip-like surfaces mutually inclined obliquely to one another by less than 180° (e.g. at an inclined angle of the order of 170°). This upper limb or cross-piece 23 of bracket member 21 in use supports a removable elongate strip 24 having a surface 28 provided with abrasive material (e.g. abrasive particles bonded thereto), the opposite surface of the strip being coated with adhesive that, prior to being adhered to the said surface (opposite to web part 22) of the cross-piece 23, is adhered to a removable backing strip of Kraft paper or the like (not shown). The web part 22 is formed as a channel 25 of generally C-shaped cross-section with the end portions 26 of the "C" being in substantially a common plane that extends substantially parallel to the bight wall 27 of the "C" and such that ends of the "C" are directed towards one another.

**[0016]** The sharpening means further comprises a pair of holding members 30 slidable longitudinally of the channel 25 in the bracket member's web part 22 such as to be longitudinally spaced apart in use. Each holding member 30 is of generally L-shape having a first limb 31 to engage in said channel 25, and a second limb 32, longer than the first limb 31, to extend over the lawnmower's bottom blade and beyond the end of the adjacent part of the cross-piece 23. Near its free end, this second limb 32 is provided with a threaded aperture 33 to receive in threaded engagement a screw-threaded member 34. In use the screw-threaded member 34 engages the lawnmower's bottom blade 15 such that, with the holding member 30 engaged in the channel 25 of said web part 22, the bracket member 21 may be fastened clampingly to the bottom blade 15 of the cylinder mower C be it one that, as shown in Figs 2 and 3, is of J-section or be it one that is of rectangular transverse

cross-section. (as common with the older kind of cylinder lawnmower).

**[0017]** Preparatory to mounting the sharpening means 20 onto the lawnmower 10 for sharpening the helical blades 12, the adjusting mechanism provided on the lawnmower is operated to open to a maximum the gap between the forward edge or lip of the bottom blade 15 and the cylindrical path 16 of the tips of the helical blades 12. This adjusting mechanism usually comprises spring-mounted screws that act on the spindle 14 of the cutting cylinder. Before or after effecting such gap adjustment, the lawnmower 10 is turned onto its side (the position shown in Fig 1) or tipped backwards, in either case to facilitate access to the helical blades 12 and the bottom blade 15. Any hard-packed grass adhering to the blades is scraped off.

**[0018]** The sharpening attachment 20 is then mounted on the bottom blade 15 with that blade's leading edge abutting against the web part 22 of the bracket member 21 (see Fig 3). The two holding members 30 are then inserted into the C-channel 25 and slid along it until they are suitably positioned in spaced apart relation longitudinally of the bottom blade 15. These holding members are finally clamped to the bottom blade 15 by the screws 34 against the lower surface 19 of the bottom fixed blade 15. By providing for such a sliding fitment of the holding members 30, their positions can be selected to ensure that they are clamped to uninterrupted and 'wholesome' areas of the bottom plate 15 and away from any holes or rivets or fixing or adjusting screws located in the bottom plate 15.

**[0019]** The lawnmower's adjusting mechanism is then operated again to lower the cylinder provided by helical blades 12 on axle 14 and bring one of the helical blades 12 into firm contact with the abrasive surface 28 of strip 24 adhered onto the cross-piece 23 of the sharpening attachment's bracket member 21. The strip's abrasive material 28 then lies generally tangential to the cylindrical path traversed by the helical blades 12. Finally, the cylinder is rotated at normal cutting speed (but with the lawnmower off the grass) by either switching on the power (if the lawnmower is power driven) or, in the case of a hand mower, by moving the mower in the forwards (cutting) direction or both backwards and forwards.

**[0020]** As the blades 12 are rotated, each blade 12 of the cutting cylinder thus comes sequentially into frictional engagement of the abrasive strip 24 and is thereby sharpened by the same amount, and to the correct angle, since the point of contact with the abrasive strip 24 is that at which cutting normally takes place. Removal of the attachment and re-adjustment of the cutting cylinder (of helical blades 12 around axle 14) relative to the fixed bottom blade 15 completes the sharpening operation.

**[0021]** With a lawnmower having a flat bottom blade 15 of rectangular transverse cross-section (instead of the J-shaped cross-section blade of Figs 2-4), the same sequence of operations is effected with the same sharp-

ening attachment 20.

[0022] In a modification the holding members 30 are slightly modified from exact L-shaped form and may, for example, have the form illustrated in Fig 4. In this, the second limb 32 has two portions, 32a and 32b. Portion 32a is joined to first limb 31 and extends at 90° to it. Portion 32b is approximately twice the length of portion 32a and is angled to it, the planes containing portions 32a and 32b being at an angle of between 114° to 150°, preferably approximately 132°. In a specific example, this modified holding member 30 is formed by cutting a length of mild steel strip of 12mm width and 2mm thickness, and forming this by one or more bending operations to provide limb 31 of 9mm length, limb portion 32a of 9mm length, and limb portion 32b of approximately 18mm length, the threaded screw hole 33 having its axis approximately 6mm from the free tip end of limb portion 32b distal from limb 31 and being threaded to suit a 10m M4 cheesehead screw 34.

[0023] In another modification, the two holding members 30 are each of generally T-shaped cross-section (rather than L-shaped cross-section). One limb, constituting the cross-piece of the T (and corresponding to said first limb 31), is formed as two parts extending in opposite directions to each side from one end of the second limb 32 of the "T" and is to engage in the two opposite halves of the generally C-shaped cross-section channel. This provides for a more secure engagement between the two holding members and the web part 22 of the bracket member 21. The modified holding members may be formed by suitable stamping and bending of a metal strip or blank, or by cutting off sections from an extruded profile of the appropriate T-section shape.

## Claims

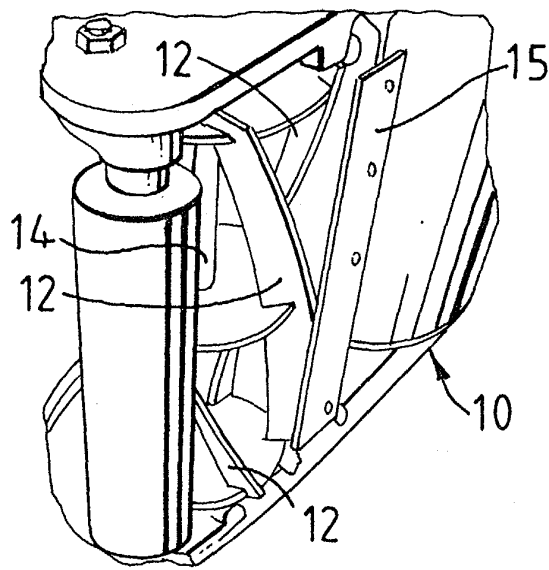
1. For a lawnmower (10) of the cylinder type and having a bottom blade (15) of substantially J-shaped cross-section, a sharpening attachment (20) of the defined kind **characterised in that**

said bracket member (21) is generally of T-shaped transverse cross-section having a web part (22) and a cross-piece (23) extending to each side of one end of the web part (22), the cross-piece (23) being to support said elongate strip (24) and the web part (22) being formed as a channel (25) of generally C-shaped cross-section with ends (26) of the "C" directed towards one another, and in that

said releasable fastening means (30-34) comprises at least one holding member (32) having a first limb (31) to engage in said channel (25) and a second limb (32), longer than the first, to extend over the lawnmower's bottom blade (15), said second limb (32) having a threaded aperture (33) therein to receive in threaded engagement a screw-threaded fastening member (34) that in use engag-

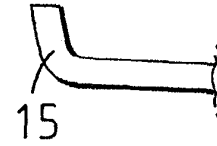
es the lawnmower's bottom blade (15) such that, with the holding member's first limb (31) engaged in the channel (25) of said web part (22), the bracket member (20) may be clampingly fastened to the bottom blade (15).

2. A sharpening attachment according to Claim 1, wherein the holding member (32) is of generally L-shaped cross-section whereby said first limb (31) in use engages in one half of the generally C-shaped cross-section channel (25).
3. A sharpening attachment according to Claim 1, wherein the holding member (32) is of generally T-shaped cross section whereby said first limb (31) has two parts that extend in opposite directions and engage in the two opposite halves of the generally C-shaped cross-section channel (25).
4. A sharpening attachment according to any preceding Claim, wherein two such holding members (32) are provided that are slidable longitudinally of the channel (25) to be longitudinally spaced apart in use.
5. A sharpening attachment according to any preceding Claim, wherein the elongate strip (24) is removably mountable on the bracket member.
6. A sharpening attachment according to any preceding Claim, wherein the elongate strip (24) is a flexible strip having a coating of abrasive material (28) on one surface constituting the surface aforesaid, and an opposite surface is coated with adhesive.
7. A sharpening attachment according to any preceding Claim, wherein the cross-piece (23) comprises two elongate strip-like surfaces mutually inclined to one another by less than 180° (e.g. at an angle of the order of 170°)
8. A sharpening attachment according to any preceding Claim, wherein the web part (22) has the ends of the "C" in substantially a common plane disposed substantially parallel to the bight wall of the "C".

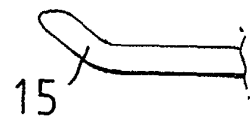


**FIG. 1**

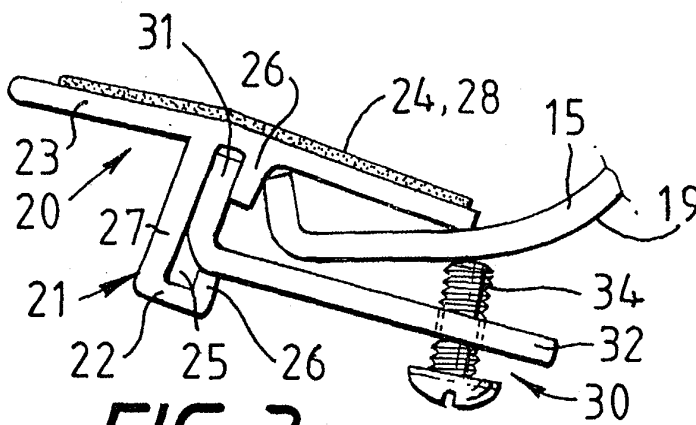
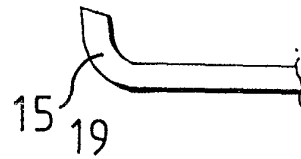
**FIG. 2A**



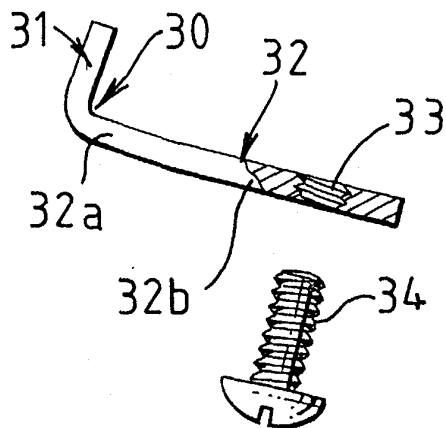
**FIG. 2B**



**FIG. 2C**



**FIG. 3**



**FIG. 4**



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# EUROPEAN SEARCH REPORT

Application Number  
EP 03 25 1306

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                              |                                                            |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                | Relevant to claim                                          | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | GB 1 514 615 A (MOWSHARP LTD)<br>14 June 1978 (1978-06-14)<br>* page 2, line 77 - line 108; figures *<br>--- | 1                                                          | B24B3/36<br>B24B3/42                         |
| D,A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | GB 2 029 736 A (SWEETLOVE A)<br>26 March 1980 (1980-03-26)<br>* page 1, line 66 - line 122 *<br>-----        | 1                                                          |                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                              |                                                            | TECHNICAL FIELDS SEARCHED (Int.Cl.7)         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                              |                                                            | B24B                                         |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                              |                                                            |                                              |
| Place of search<br><b>THE HAGUE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                              | Date of completion of the search<br><b>29 October 2003</b> | Examiner<br><b>Eschbach, D</b>               |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                              |                                                            |                                              |

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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29-10-2003

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
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