(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 243 048**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **87303133.0**

(51) Int. Cl.4: **B24D 15/08**

(22) Date of filing: **10.04.87**

(30) Priority: **25.04.86 GB 8610177**

(43) Date of publication of application:
28.10.87 Bulletin 87/44

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

(71) Applicant: **WILKINSON SWORD LIMITED**
Sword House Totteridge Road
High Wycombe Buckinghamshire HP13
6EJ(GB)

(72) Inventor: **McPhee, Alexander**
2 Calumet, Reynolds Road,
Beaconsfield, Buckinghamshire HP9
2LZ(GB)

(74) Representative: **Knott, Stephen Gilbert et al**
MATHISEN, MACARA & CO. The Coach
House 6-8 Swakeleys Road
Ickenham Uxbridge Middlesex UB10 8BZ(GB)

(54) Knife sharpeners.

(57) A knife sharpener is provided with carbide cutters (25) carried on a sharpening device (11) which can be releasably latched against the action of a spring in an inoperative position. This reduces wear on the blade edge (38) by ensuring that the edge is sharpened only when required. In addition, a blade retaining device (12) is provided which retains a blade (39) in the sharpener even when the carbide cutters are rendered inoperative.

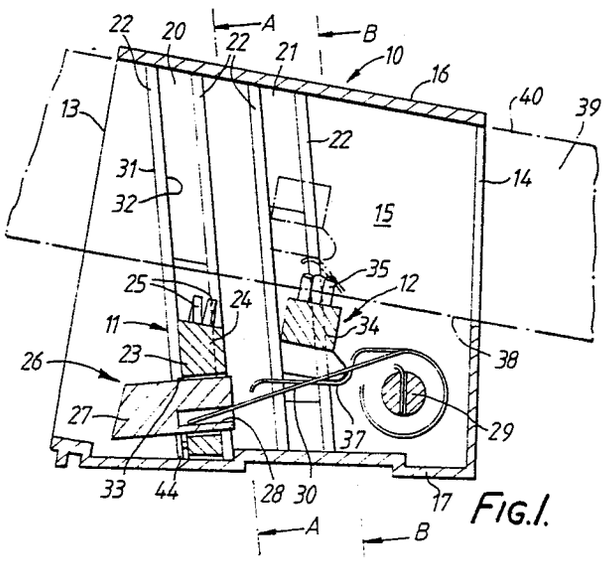

FIG.1.

EP 0 243 048 A1

KNIFE SHARPENERS

The invention relates to knife sharpeners which are carried within a scabbard or housing in which a blade of a knife is received when not in use.

Such knife sharpeners include a sharpening device which is engaged by a blade edge when the blade is inserted into or removed from the scabbard or housing. In general, the sharpening device maintains a permanent operative position i.e. it engages the blade edge with a sharpening action on every occasion when the blade is inserted into or removed from the scabbard or housing.

It is a disadvantage of such a knife sharpener that the invariable sharpening action effected by the sharpening device can lead to such rapid removal of material from the blade edge as to cause a rapid wearing away of the blade edge. In addition, this invariable sharpening of the blade edge is not necessary; in many cases, where the blade performs a simple cutting task on removal from the scabbard or housing, the sharpness of the edge is not affected by the task and consequently no resharpening is necessary on reinsertion of the blade.

According to a first aspect of the invention, there is provided a knife sharpener of the kind comprising a guideway for receiving a knife blade and a sharpening device urged by a spring into a blade edge engaging position, characterised in that the sharpening means are releasably latchable against the action of said spring in an inoperative position.

In this way, the sharpening device can be rendered ineffective and only engage with the blade when sharpening is required.

In known knife sharpeners where the sharpening device invariably engages a knife blade inserted into or removed from the associated housing or scabbard, the sharpening device generally performs a dual function of both sharpening the edge and retaining the knife blade within the sharpener.

According to a second aspect of the invention, there is provided a knife sharpener of the kind comprising a guideway for engaging a back edge of a knife blade on insertion of the blade into the sharpener and a sharpening device for sharpening an edge of the knife blade, characterised in that the sharpening device is selectively positionable to engage a blade of the knife inserted into the sharpener or to be inoperative, and a blade retaining device is provided for urging an inserted blade into engagement with the guideway to retain the blade within the sharpener when the sharpening device is in said inoperative position.

By providing the blade retaining device in combination with the sharpening device which can be positioned for engagement with a knife blade, or rendered inoperative, the knife blade is reliably retained within the sharpener even when the sharpening device is rendered inoperative.

The following is a more detailed description of an embodiment of the invention, by way of example, reference being made to the accompanying drawings in which:-

Figure 1 is a sectional side elevation of a knife sharpener including a housing, a sharpening device and a blade retaining device, the sharpening device being in an inoperative position,

Figure 2 is a similar view to Figure 1 but showing the sharpening device in engagement with an edge of a knife blade inserted into the housing,

Figure 3 is a schematic perspective view of a detent on the sharpening device shown in Figures 1 and 2,

Figure 4 is a section on the line A-A of Figure 1, and

Figure 5 is a section on the line B-B of Figure 1.

Referring first to Figures 1 and 2, the knife sharpener comprises a housing 10, a sharpening device 11 and a blade retaining device 12. The housing 10 has a generally rectangular entrance 13 (see Fig.4) and exit 14 formed between side walls 15 and upper and lower walls 16 and 17 respectively. A guideway 18 (Fig.4) is formed within the housing 10 firstly between two angled members 43 and then between two parallel members 19, with both sets of members being disposed on opposite sides of a plane including the centre line of the housing 10 and parallel to the side walls 15 of the housing 10. The members 43, 19 depend from the upper wall 16 of the housing which thus forms a base to the guideway.

Two pairs of grooves 20, 21 are provided within the housing 10. Each groove 20, 21 is formed by a pair of parallel flanges 22 extending from an associated side wall 15 of the housing 10. The grooves of each pair 20 or 21 extend downwardly and inwardly of the housing 10 (see Figs.1 and 2).

The pairs of grooves 20, 21 are parallel to one another but are spaced apart (see Fig.1).

The first pair of grooves 20 receive respective edges of the sharpening device 11, which is thus constrained to rectilinear sliding movement between the upper and lower ends of the associated grooves 20. The sharpening device 11 comprises a carrier 23 having on its upper surface 24 a pair of carbide cutters 25 which form a V-notch between them for receipt of an edge of a knife blade to be

sharpened. The carrier 23 is provided with a central aperture within which is mounted a detent 26 (see Figure 3) formed with a pair of side grooves 40 (Figure 3) which engage corresponding ones 22 of each pair of flanges forming the associated grooves 20. The detent 26 has an upper surface 41. An end of the detent 26 adjacent the entrance to the housing forms a manually operable button 27.

The opposite end of the detent 26 is formed with an aperture 28 which receives one end of a spiral spring 30 whose other end is fixed to a mounting 29 provided in the housing 10 on a side of the sharpening device 11 opposite to the entrance 13 of the housing 10. In the positions of the sharpening device shown in Figures 1 and 2, the spring 30 is bowed in stress so that the detent 26 and hence the sharpening device are urged upwardly and outwardly in the associated grooves 20.

The two groove forming flanges 22 adjacent the entrance 13 of the housing 10 have respective inner and outer surfaces 31, 32 which are parallel to give the flanges, in the upper parts of the flanges 22, a constant wider thickness. However, towards their lower ends, these flanges 22 are of reduced thickness (see Figures 1 and 2) with the reduced thickness portion 44 being connected to the increased thickness portion by a step 33, whose function will be described below.

The mounting of the detent 26 in the carrier 23 is such as to allow limited relative movement between the detent 26 and the carrier 23, again for a purpose to be described below.

The other pair of grooves 21 receive corresponding edges of the blade retaining device 12 see also Figure 5), which is thus restrained for sliding movement between the upper and lower ends of the grooves 21. The blade retaining device 12 comprises a block 34 on which are mounted three pins 35 which together form a V-notch for receipt of a blade edge. The angle of the V-notch is less than the angle of the carbide cutters 25. As seen in Figure 5, the block 34 is cut away to one side in order to prevent any interference by the block 34 with the spring 30 for the sharpening device 11.

An end of a second spiral spring 36 engages an abutment 37 on the block 34 and the opposite end of the spring 36 is connected to the mounting 29. The second spring 36 is stressed in the position shown in Figures 1 and 2, so that the blade retaining device 12 is urged towards the upper ends of the associated grooves 21.

In use, the housing 10 may be mounted at an open end of a scabbard (not shown) with the entrance 13 to the housing forming an entrance to the scabbard. Alternatively, however, the housing 10 can be mounted alone on a wall or at any other convenient situation.

When a blade edge (shown in Figures 1 and 2 in broken line at 38) of a knife blade (shown in Figures 1 and 2 in broken line at 39) is to be sharpened, the sharpening device 11 is in the blade engaging position shown in Figure 2. The blade 39 is inserted into the housing entrance 13 with a back edge 40 of the blade being guided by the guideway 18 and the blade edge 38 at the blade tip engaging in the V-notch formed by the carbide cutters 25. Continued insertion of the blade 39 forces the sharpening device 11 downwards against the action of the associated spring 30. The tip of the blade then engages with the sides of the V-notch formed by the pins 35 (since the angle of the V-notch is less than the angle of the carbide cutters and hence less than the angle of the blade edge) and forces the blade retaining device 12 downwardly against the action of the second spring 37 on continued insertion of the blade 39. Insertion is then further continued until the end of the blade handle (not shown) abuts the housing 10.

On removal of the blade 39, the action is reversed: with the carbide cutters 25 sharpening the blade edge 38.

However, at any time, the sharpening device 11 may be rendered inoperable. This is done by pressing downwardly the button 27 on the detent 26, to slide the sharpening device 11 downwardly in the associated grooves 20. As the detent 26 comes adjacent the step 33 on the groove flanges 22, the spring 30, which provides not only a force in a direction along the grooves 20, but also provides a force at right angles to that direction, causes the detent 26 to slide relative to the carrier 23 to engage the upper surface 41 of the detent 26 under the step 33 in the flanges 22 and to cause the detent to engage against the reduced thickness portions 44 of the flanges 22.

In this way, the sharpening device 11 is latched in an inoperative position against the action of the spring 30, as shown in Figure 1.

On insertion of a blade 39 with the sharpening device 11 in this position, the back edge 40 of the blade will, as before, engage in the guideway 18. The tip of the blade will first engage the blade retaining device 12, passing through the V-notch formed by the pins 35. This will force the blade retaining device 12 downwardly against the action of the second spring 37. There will be no sharpening action. When the blade 39 is fully inserted, it is retained in the housing 10 by the force of the second spring 37 acting on the blade retaining

device 12 to hold the blade between this device and the upper wall 16 forming the base of the guideway 18. This will prevent the knife falling out of the housing 10 and the scabbard, where such is provided.

If it is subsequently required to sharpen a blade edge 38, the button 27 formed on the detent 26 is pressed, to cause the detent 26 to perform a reverse sliding movement, which unlatches the detent 26 from the step 33 and allows the first spring 30 to push the sharpening device 11 up the guideway up towards the upper ends of the associated grooves 20. In this position, the carbide cutters 25 can be engaged by the edge 38 of a blade 39 inserted into the housing 10.

The knife sharpener described above with reference to the drawings thus provides a sharpening device 11 which can be rendered inoperative, as desired. This lengthens the life of the blade by ensuring that sharpening is effected only when required. This also lengthens the life of the carbide cutters 25.

In addition, the knife sharpener retains the blade relatively to the sharpener even when the sharpening device 11 is rendered inoperative. Thus the rendering of the sharpening device inoperative does not affect the use of the housing 10, and any associated scabbard, to hold the blade.

It will be appreciated that it is not necessary to use leaf springs to apply the required spring force. Any suitable spring may be required which performs the necessary action. For example, the blade retaining device may be urged by a helical spring or a leaf spring or a suitably arranged torsion spring. Alternative springs may be used on the sharpening device as well. The two pairs of grooves 20, 21 need not be parallel, they could converge towards the top of the housing 10. In addition, the grooves 20 accommodating the sharpening means could be curved to ensure accurate orientation of the carbide cutters 25 relative to the blade edge 38 towards the tip of a knife.

Claims

1. A knife sharpener of the kind comprising a guideway (18) for receiving a knife blade (39) and a sharpening device (11) urged by a spring (30) into a blade edge engaging position, characterised in that the sharpening means (11) are releasably latchable against the action of said spring (30) in an inoperative position.

2. A knife sharpener according to claim 1, characterised in that a blade retaining device (12) is provided for engaging an inserted blade (39) and urging the blade into engagement with a portion of the guideway which engages a back edge of the blade, to retain the blade (39) within the sharpener when the sharpening device (11) is latched in said inoperative position.

3. A knife sharpener of the kind comprising a guideway (18) for engaging a back edge (40) of a knife blade (39) on insertion of the blade (39) into the sharpener and a sharpening device (11) for sharpening an edge of the knife blade (39), characterised in that the sharpening device (11) is selectively positionable to engage a blade of the knife inserted into the sharpener or to be inoperative, and a blade retaining device (12) is provided for urging an inserted blade (39) into engagement with the guideway (18) to retain the blade (39) within the sharpener when the sharpening device (11) is in said inoperative position.

4. A knife sharpener according to claim 3, characterised in that the sharpening device (11) is urged by a spring (30) into a blade engaging position, the sharpening device (11) being releasably latchable against the action of said spring in an inoperative position.

5. A knife sharpener according to any one of claims 1, 2, or 4, characterised in that the releasable latching is effected by a manually operable detent (26) which moves with the sharpening device (11) and which engages when the sharpening device (11) is in said inoperative position to maintain the sharpening device (11) in said inoperative position, the operation of the said detent (26) disengaging said detent to allow the sharpening device (11) to move to said blade engaging position.

6. A knife sharpener according to claim 5 characterised in that the detent (26) is movable relatively to the sharpening device (11) into and out of engagement with grooves (20), by which the sharpening device (11) is guided in the movement thereof, when the sharpening device (11) is in said inoperative position, the detent (26) being urged into engagement with the grooves (20), by said spring (30) when the sharpening device is in said inoperative position.

7. A knife sharpener according to claim 6, characterised in that the grooves (20) are provided with respective steps (33) which engage behind a co-operating portion of the detent (26) when the sharpening device (11) is in said inoperative position.

8. A knife sharpener according to any one of claims 1, 2 and 4 to 7, characterised in that the spring is a spiral spring (30) connected between the sharpening device and a point on a side of the sharpening device opposite to an entrance to said guideway.

9. A knife sharpener according to any one of claims 2 to 4 or to any one of claims 5 to 8 when dependant on any one of claims 2 to 4, characterised in that the blade retaining device (12) is

mounted for movement towards and away from the knife blade and is urged by a spring (37) into engagement with an edge (38) of an inserted blade (39).

10. A knife sharpener according to any one of claims 2 to 4, or 9, or to any one of claims 5 to 8 when dependant on any one of claims 2 to 4, characterised in that the blade retaining device (12) comprises a block (34) on which are carried a plurality of pins (35) which together form a V-notch for receipt of a blade edge (38).

11. A knife sharpener according to any one of claims 2 to 4, or 9 or 10 or to any one of claims 5 to 8 when dependant on any one of claims 2 to 4, characterised in that the sharpening device (11) is mounted before the blade retaining device (12), in the direction of insertion of the knife blade (39).

12. A knife sharpener according to any one of claims 2 to 4 or 9 to 11 or to any one of claims 5 to 8 when dependant on any one of claims 2 to 4, characterised in that the sharpening device (11) and the blade retaining device (12) are movable within a housing (10) which forms said guideway (18) for the back edge (40) of a blade (39) and which forms an entrance for the receipt of a knife blade (39) the housing (10) being received in an open end of a scabbard.

13. A knife sharpener according to any one of claims 1 to 12, characterised in that the sharpening device comprises a pair of cutter blades (25) which form a V-notch therebetween, the planes of said plates (25) being angled (Fig. 4) relative to a plane normal to the length of the sharpener.

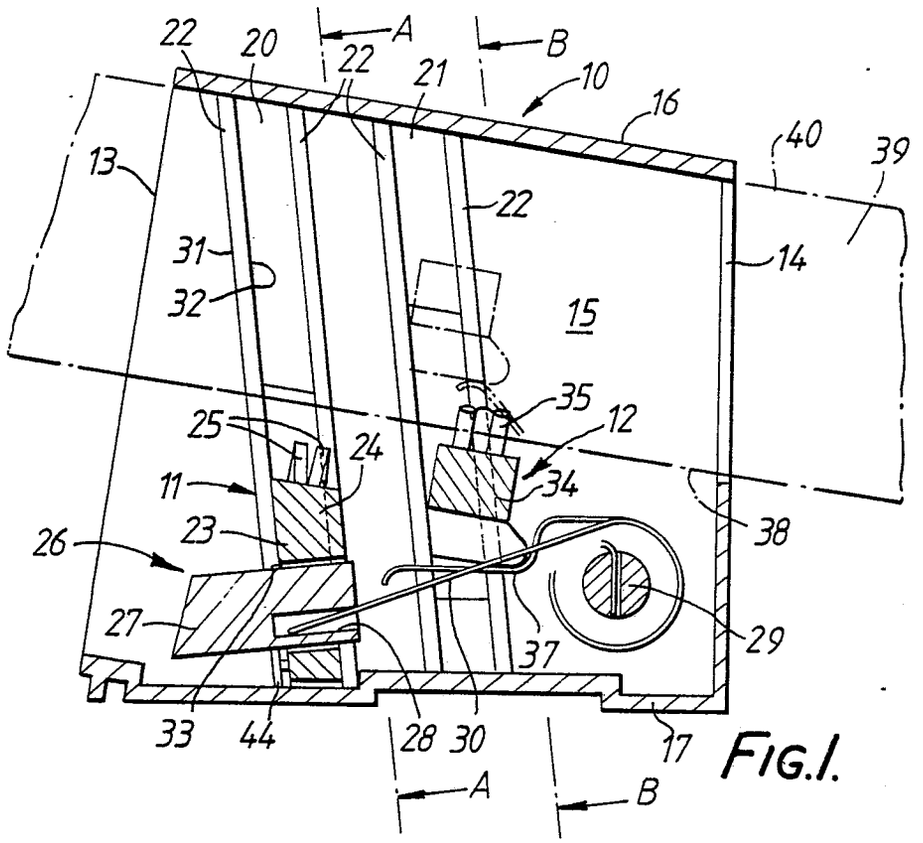
22
20
A
22
21
B
10
16
40
39
13
22
31
14
32
15
35
25
12
24
34
11
38
26
23
29
27
37
33
44
28
30
17
A
B

FIG.1.

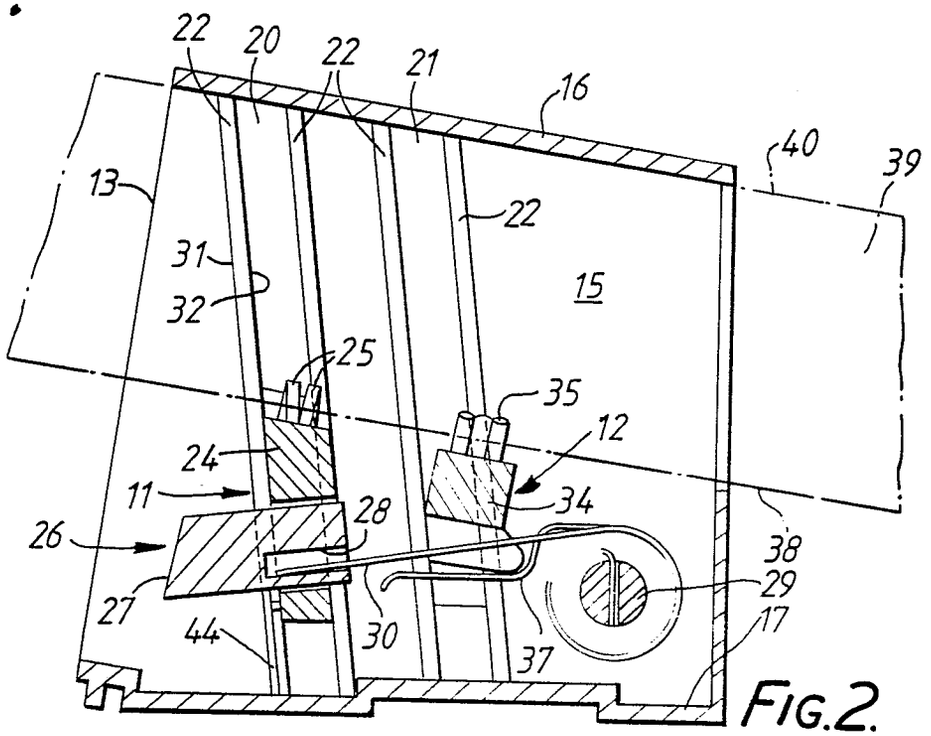
22
20
22
21
16
40
39
13
22
31
15
32
25
35
12
24
34
11
28
38
26
29
27
30
37
44
17

FIG.2.

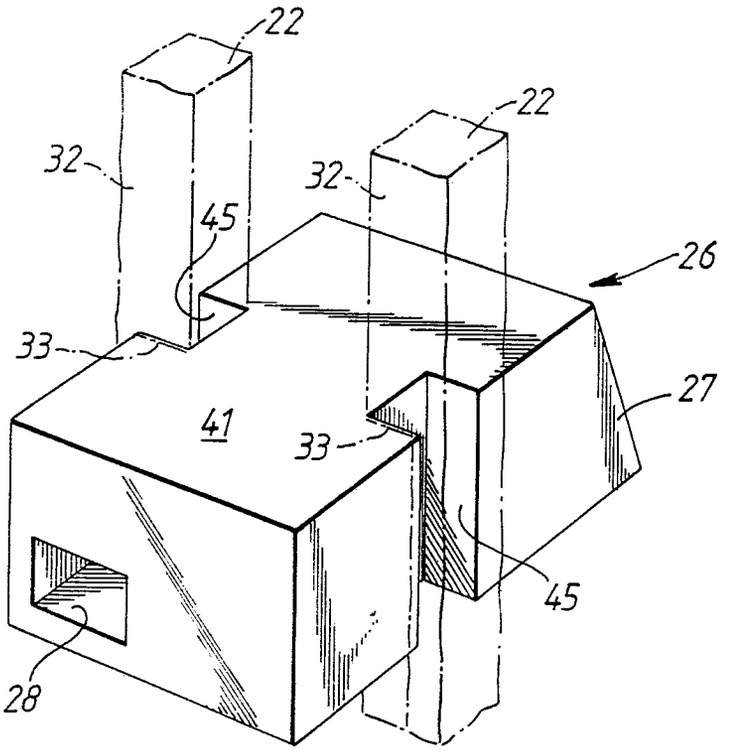

FIG. 3.

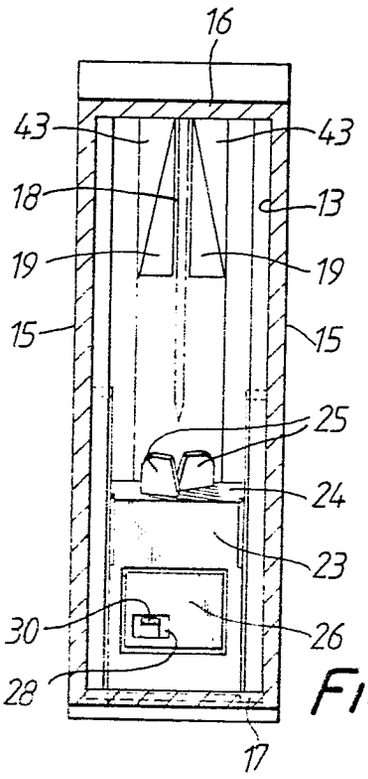

FIG. 4.

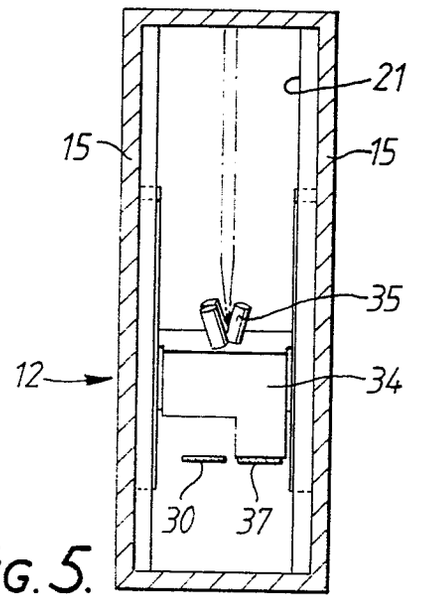

FIG. 5.

European Patent Office

EUROPEAN SEARCH REPORT

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT

EP 87303133.0

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	EP - A2 - 0 110 661 (WILTSHIRE) * Fig. 2-7 * --	1,3	B 24 D 15/08
A	US - A - 3 774 350 (BAYLY) * Fig. 1,2,3,6 * --	1,3	
P,A	EP - A2 - 0 185 483 (WILKINSON) * Fig. 1-7; page 9, line 15 - page 12, line 11 * ----	1,3	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 24 D 15/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	01-06-1987	LEBZELTERN

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO Form 1503 03 82