

12 **EUROPEAN PATENT APPLICATION**

21 Application number: **84306539.2**

51 Int. Cl.⁴: **B 27 C 7/00**

22 Date of filing: **26.09.84**

30 Priority: **11.10.83 AU 1786/83**

43 Date of publication of application:
02.05.85 Bulletin 85/18

84 Designated Contracting States:
CH DE FR GB IT LI NL SE

71 Applicant: **Smith, Vincent Sidney**
82, Warwick Street
Hobart Tasmania(AU)

72 Inventor: **Smith, Vincent Sidney**
82, Warwick Street
Hobart Tasmania(AU)

74 Representative: **Carter, Gerald et al,**
Arthur R. Davies & Co. 27 Imperial Square
Cheltenham GL50 1RQ(GB)

54 **Woodturning Tool.**

57 A woodturning tool, for use in cutting and shaping a timber workpiece, has an elongate tool shank (2) for manual holding of the tool and a cutting head (7) at one end of the shank. The cutting head has a cutting face (8) and a recess (10) opening onto the cutting face. The opening (10) has a periphery which is of continuous extent, or nearly so, and which is convexly curved along at least a part thereof. A

curved cutting edge (14) extends along at least a section of the curved periphery part and faces laterally outwardly from the tool shank (2). In tool use, the cutting head (7) rests on a surface of the turning workpiece and the cutting edge (14) convexly curves toward and engages the workpiece surface in a cutting action.

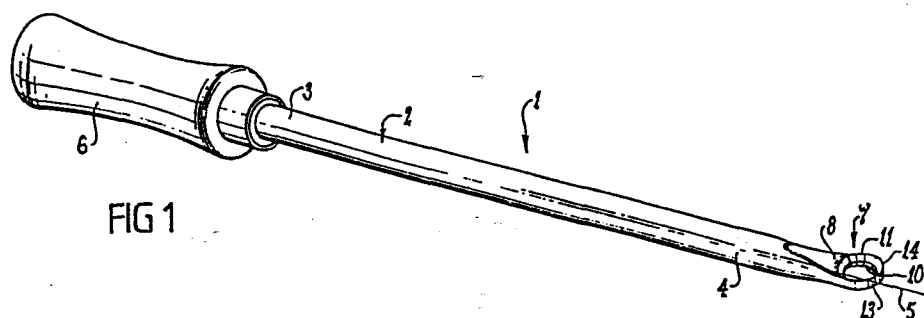


FIG 1

-2-

This invention relates generally to woodturning and, in particular, to a hand-held tool for use in the shaping of a timber workpiece into an article on a woodturning lathe. The tool is applicable in the woodturning of hollow-ware articles such as bowls, goblets, canisters and other containers, and it will be convenient to hereinafter describe the invention in relation to that exemplary application. It is to be appreciated, however, that the invention is not limited to that application and may be equally applicable to other articles, for example, spindle-ware such as furniture legs.

A large range of woodturning tools are available for shaping pieces of timber into hollow-ware articles. Those tools include cutting tools such as chisels and gouges as well as scraping tools such as scrapers, and are variously shaped to permit rapid rough cutting and scraping followed by more careful fine surface finishing of timber in order to form a smooth hollow-ware article quickly.

In using these tools a cutting edge is usually pushed into the timber fibres to force their severing and, particularly in end-grain hollowing of timber, that pushing occurs against or across the fibre grain. Whilst a fine surface finish can be achieved, it does require considerable expertise and concentration on the part of the toolturner in order to minimise ragged tearing of the timber fibre or more serious timber gouging. As such, fine finishing can be difficult to achieve and indeed articles can be severely damaged during that finishing, particularly by inexperienced woodturners.

In addition, existing cutting tools fine finish article hollows most effectively when a trailing corner of the tool cutting edge is very close to the timber surface being cut. Unless considerable care is exercised that trailing corner can contact the surface causing the cutting edge to dig into the timber. That can result in irreparable damage to the timber. Moreover, the tool can react violently causing it to be wrenched from the control of the woodturner with possible dangerous consequences.

It is an object of the present invention to provide a relatively simple woodturning tool which may alleviate these disadvantages of current tools. It is another object of the

-3-

present invention to provide a tool that permits fine surface finishing of surfaces of timber workpieces shaped on a woodturning lathe.

With the above objects in mind, the present invention provides a tool for use in cutting a turning timber workpiece, including: an elongate tool shank; and, a cutting head at one end of the tool shank, the cutting head having a cutting face and a recess opening onto the cutting face, the opening having a periphery which is of at least substantially continuous extent about the opening and which is convexly curved along at least a partial extent thereof, and the cutting head has a curved cutting edge extending along at least a section of the curved periphery part whereby, in use, the tool is presented to a turning timber workpiece so that the cutting head rests on a surface of the workpiece and the cutting edge convexly curves toward and engages the workpiece surface in a cutting action.

Preferably, the recess forms an inner surface of the cutting head. The cutting head preferably also has an outer surface which is outwardly of and extends at least in part about that inner surface. It is these inner and outer surfaces which preferably converge together to provide the cutting edge. In so converging, the inner surface may be raked away from the cutting edge and the outer surface at an angle to an axis which extends perpendicular to the cutting face. Similarly, the outer surface may be raked away from that cutting edge and the inner surface at an angle to the perpendicular axis.

Preferably, the cutting edge extends through an angle of at least about 180° . That cutting edge is preferably arcuate in shape. The opening periphery may be of a continuous extent, and may be circular in shape and in that case the cutting edge may extend entirely along the opening periphery.

Preferably, the cutting face will lie in a plane which is at least substantially parallel to the longitudinal extent of the tool shank. To that end, the cutting face may lie parallel to the tool shank so that the cutting edge faces perpendicular to that longitudinal extent. Alternatively, that cutting face may be angled slightly to that longitudinal

-4-

extent, and one typical angle may be about 15° .

Preferably, the recess is an open-ended hole that passes entirely through the cutting head. Such a hole may facilitate removal of timber workpiece fibres from the cutting edge. That hole may pass through the cutting head at least substantially perpendicular to the cutting face.

10 Although the tool may have only one cutting edge, where the recess is an open-ended hole, another cutting edge may be provided on the cutting head. To that end, the cutting head may have another cutting face onto which the other open end of the hole opens, and that other opening may have a periphery along at least a part of which extends another curved cutting edge. These two cutting edges may increase the versatility of the tool during use.

20 The following description refers to preferred embodiments of the woodturning tool of the present invention. To facilitate an understanding of the invention, reference is made in the description to the accompanying drawings where the tool is illustrated in those preferred embodiments. It is to be understood that the tool of the present invention is not limited to the preferred embodiments as hereinafter described and illustrated in the drawings.

In the drawings where like reference numerals identify like components:

Fig. 1 is a perspective view of a first preferred embodiment of the tool of the present invention;

Fig. 2 is a side view partly in section of the tool of Fig. 1;

30 Fig. 3 is a perspective view of a second preferred embodiment of the tool of the present invention; and,

Fig. 4 is a side view partly in section of the tool of Fig. 3.

Referring initially to Figs. 1 and 2 of the drawings, there is generally illustrated woodturning tool 1. Tool 1, includes elongate tool shank 2, having spaced apart ends 3,4. In this embodiment, tool shank 2, is of a generally circular cross-sectional shape and extends generally along longitudinal axis 5.

39

-5-

During use tool 1, may be manually held by a woodturner by directly gripping shank 2. Alternatively, as in this embodiment, tool 1, is provided with separate handle 6, connected to end 3, of shank 2. That handle 6, is generally elongated and extends coaxially of tool shank 2.

Tool 1, also includes cutting head 7, at end 4, of tool shank 2. Conveniently, cutting head 7, is formed integral with shank 2, in order to improve the overall strength of tool 1.

As more clearly illustrated in Fig. 2, cutting head 7, is generally angled relative to longitudinal axis 5. Whilst that angle may vary considerably, an angle of about 15° has been found particularly suitable for some finishing applications of tool 1.

Cutting head 7, includes opposed cutting faces 8, and 9, which lie in planes extending parallel to or at least substantially parallel to longitudinal axis 5, depending upon the extent of angling of cutting head 7. Hole 10, extends through cutting head 7, so as to open onto cutting faces 8,9. In this embodiment, hole 10, is of a circular shape although other shapes having curved sections, such as ovals and slots, may be equally applicable. This hole 10, provides with cutting faces 8,9, opening peripheries 11, which are of a curved and continuous extent.

Hole 10, provides cutting head 7, with inner surface 12, and head 7, also has outer surface 13, extending partway about inner surface 12, before merging into tool shank 2. Inner surface 12, and outer surface 13, converge toward each other so as to form cutting edge 14. That convergence is achieved by raking inner surface 12, from cutting face 11, about halfway toward cutting face 9. Although outer surface 13, is illustrated as extending generally parallel to the axial extent of hole 10, that surface may alternatively or additionally be raked to provide that convergence.

The included angle α , between converging surfaces 12,13, may be any suitable angle which a woodturner using the tool finds suitable. In that regard, the angle may vary according to the height of the woodturner and the height of the woodturning lathe and in particular the tool rest of that lathe,

bearing in mind that outer surface 13, is required to rub on the surface of timber being cut for proper cutting by tool 1. In this embodiment, that included angle is about 15°.

Tool 1, of this embodiment includes only one cutting edge 14, within cutting head 7. It should be appreciated, however, that at least one further cutting edge may be incorporated into tool 1, that cutting edge being provided on cutting face 9, by suitably converging inner surface 12, and/or outer surface 13. Where this occurs, the included angle between surfaces 12, and 13, forming this further cutting edge may be the same as or different from the included angle forming cutting edge 14, a different angle possibly increasing the versatility of tool 1.

Tool 1, may be composed of any suitable material. In that regard, tool shank 2, and cutting head 7, may be composed of a tool metal such as high carbon steel, whilst handle 6, may be composed of timber or plastic.

In use tool 1, of this embodiment is presented to a surface defining a hollow of a turning timber workpiece (not illustrated) so that outer surface 13, rubs against that hollow surface. Tool 1, is then moved so that cutting edge 14, sweeps over that surface with cutting edge 14, leading and engaging the workpiece in a cutting action. Where the workpiece hollow is formed in timber end-grain, the sweep of cutting edge 14, will be generally outwardly along the hollow surface from the bottom to the opening of that hollow, whilst the sweep of cutting edge 14, is generally inwardly along the hollow surface formed in side-grain timber workpieces.

Referring now to Figs. 3 and 4 of the drawings, there is illustrated another embodiment of tool 1, in which shank 2, is of a generally square cross-sectional shape. It has been found that this particular shape may facilitate handling of tool 1. In particular, shank 2, can be rested flat against a tool rest of a woodturning lathe (not illustrated) so that cutting head 7, will be more easily orientated and retained in a correct position relative to a workpiece surface during a sweep of cutting edge 14, across that surface.

-7-

Tool 1, has cutting head 7, extending coaxially of shank 2, so that cutting faces 8,9, extend generally parallel to each other and also longitudinal axis 5. In this embodiment, cutting head 7, has hole 10, extending therethrough and inner surface 12, and outer surface 13, shaped so that cutting edges 14, are provided on each of cutting faces 8, and 9. This is achieved by raking inner surface 12, inwardly from each cutting face 8,9, halfway toward the other face.

0 Tool 1, of this other embodiment may be used in the same manner as in the previous embodiment, although of course, here the tool may be reversed for cutting timber workpiece with either cutting edge 14.

A woodturning tool according to the present invention has been found to improve severing of timber fibres when compared to previous tools and thus provide a smoother surface finish to that workpiece, particularly hollow-ware workpieces. Further, it has been found that the tool can be used in a wide variety of woodturning applications. To that extent, 0 the tool is of a general purpose nature, unlike many previous tools which have a limited or specific application in woodturning.

Because of the curved nature of the tool cutting edge, there is minimum likelihood of that cutting edge inadvertently or accidentally digging into the turning timber workpiece being shaped. As such, damage to the workpiece may be minimal. In addition, that tool is not likely to be dangerously wrenched from the control of a woodturner.

0 It is to be appreciated that modifications and/or alterations may be made to the tool without departing from the ambit of the present invention as defined in the claims appended hereto.

-8-

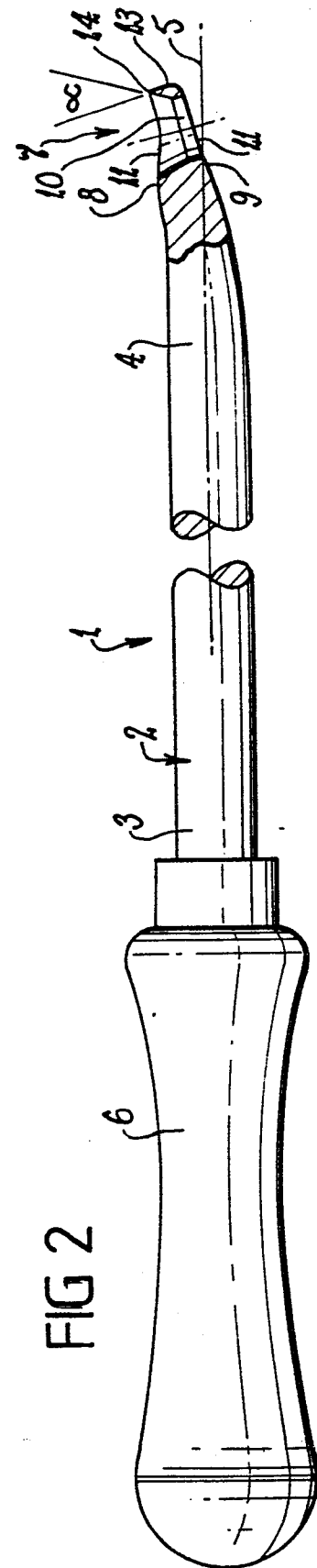
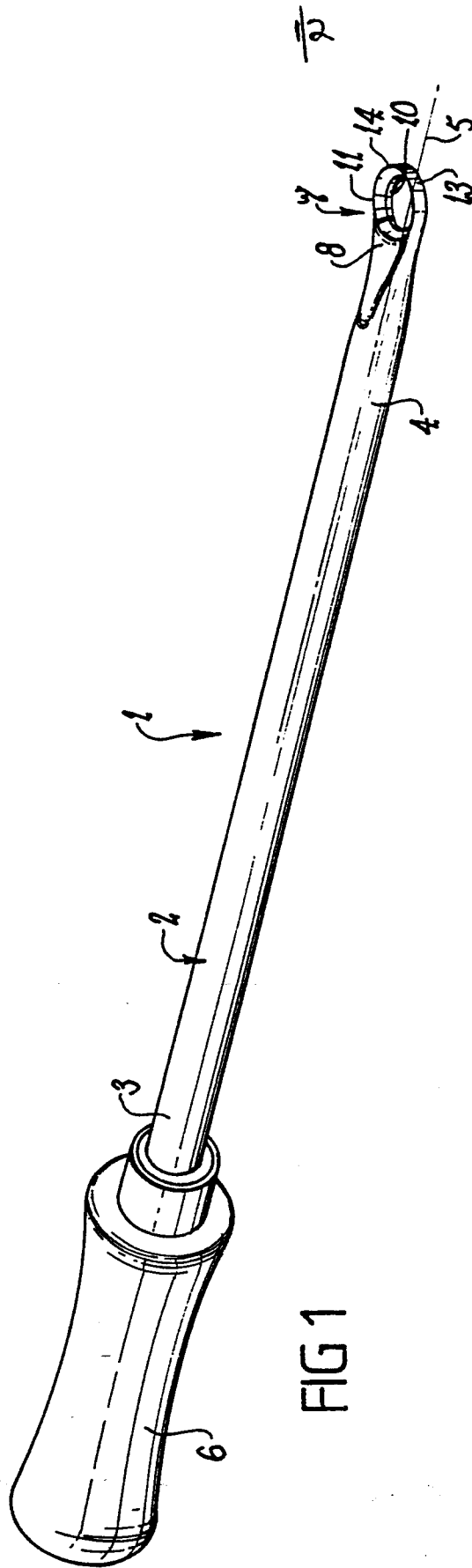
CLAIMS:

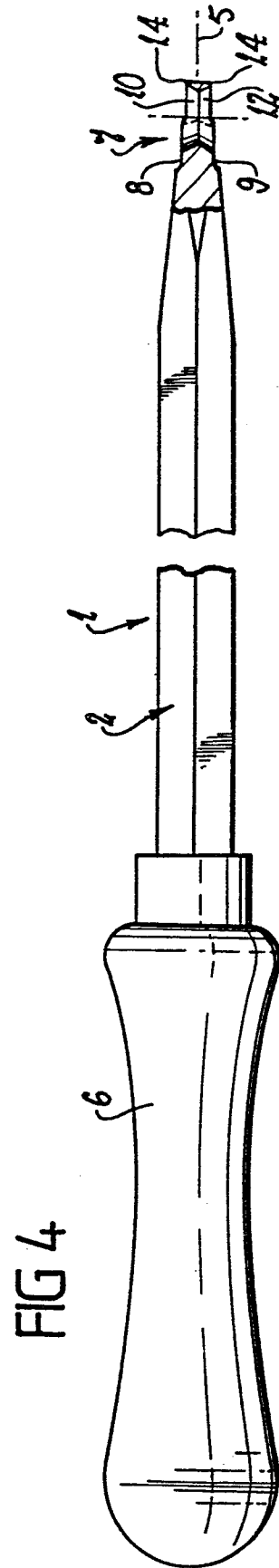
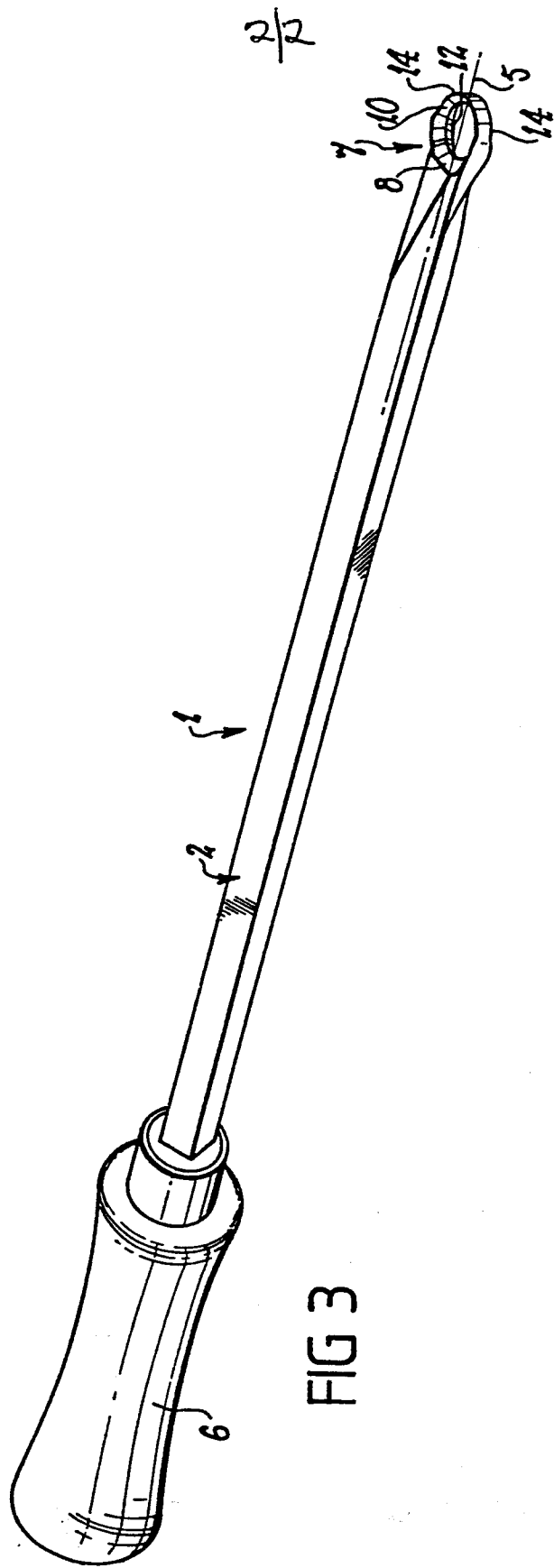
1. A tool for use in cutting a turning timber workpiece, including: an elongate tool shank; and a cutting head at one end of the tool shank, the cutting head having a cutting face and a recess opening onto the cutting face, the opening having a periphery which is of at least substantially continuous extent about the opening and which is convexly curved along at least a partial extent thereof, and the cutting head has a curved cutting edge extending along at least a section of the curved periphery part whereby, in use, the tool is presented to a turning timber workpiece so that the cutting head rests on a surface of the workpiece and the cutting edge convexly curves toward and engages the workpiece surface in a cutting action.
2. A tool as claimed in claim 1, wherein the recess forms an inner surface of the cutting head and the cutting head has an outer surface outwardly of, and extending at least in part about, the inner surface, the inner and outer surfaces converging together to provide the cutting edge.
3. A tool as claimed in claim 2, wherein the inner surface is raked away from the cutting edge and the outer surface at an angle to an axis extending perpendicular to the cutting face, and the outer surface is raked away from the cutting edge and the inner surface at an angle to the perpendicular axis.
4. A tool as claimed in any preceding claim, wherein the cutting edge extends through an angle of at least about 180° .
5. A tool as claimed in any preceding claim, wherein the cutting edge is arcuate in shape.
6. A tool as claimed in any preceding claim, wherein the opening periphery of the recess is circular in shape.
7. A tool as claimed in any preceding claim, wherein the cutting face lies in a plane which is at least substantially parallel to the longitudinal extent of the tool shank.
8. A tool as claimed in any preceding claim, wherein the recess is an open-ended hole passing entirely through the cutting head so that the opening periphery is of a continuous extent, the hole passing through the cutting head at least substantially perpendicular to the cutting face.

0139490

- 9 -

9. A tool as claimed in claim 8, wherein the cutting head has another cutting face onto which the other open end of the hole opens, the other opening having a periphery which is of at least substantially continuous extent and which is convexly curved along at least a partial extent thereof, and the cutting head has another curved cutting edge extending along at least a section of the other curved periphery part.





0139490

European Patent
Office

EUROPEAN SEARCH REPORT

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 84306539.2
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	US - A - 850 874 (TRIPP) * Totality * --	1,2,4-7	B 27 C 7/00
X	US - A - 1 003 584 (CALAHAN) * Totality * --	1	
X	US - A - 795 688 (CANE) * Totality * ----	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.4) B 27 C B 27 G
Place of search VIENNA		Date of completion of the search 21-12-1984	Examiner TRATTNER
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			