N72-21489

CASE NO. ~~XLA-10470~~ XLA-10,470
SHEET 1 OF 1
INVENTOR(S): LoVERN E. WINN

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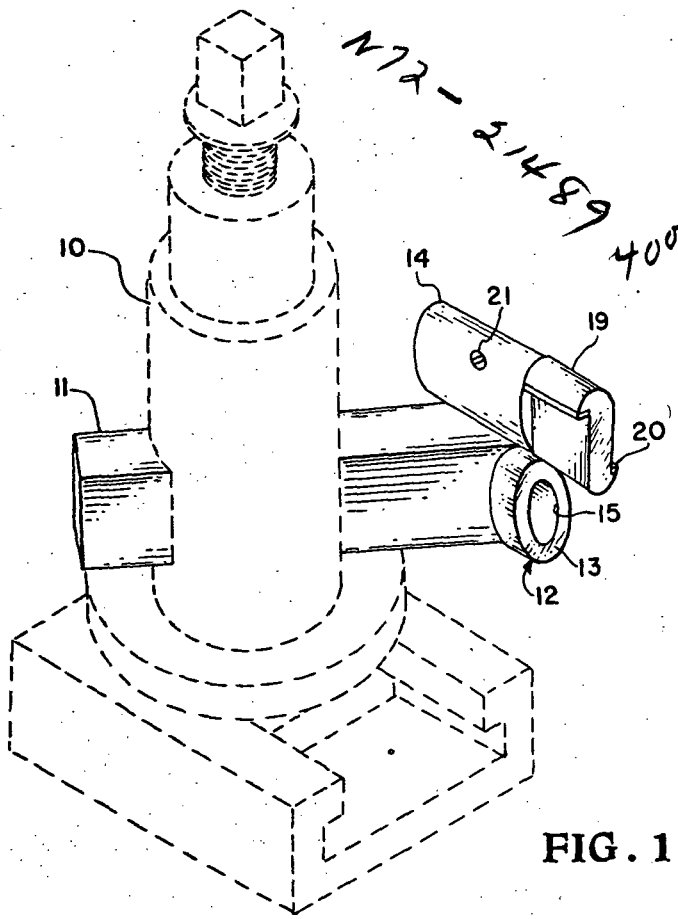

FIG. 1

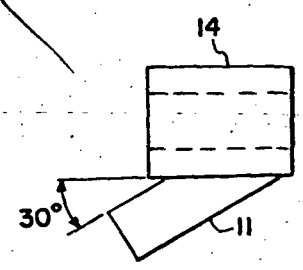

FIG. 2

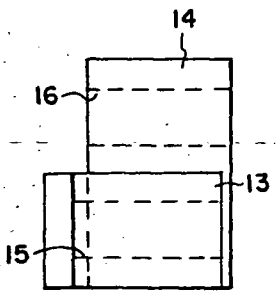

FIG. 3

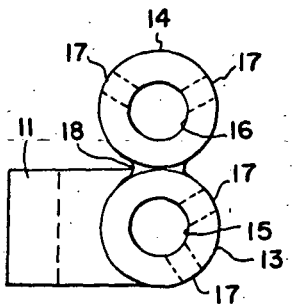

FIG. 4

NASA Case No. ~~LAR-10,470~~ XLA-10,470

LATHE TOOL BIT AND HOLDER FOR MACHINING FIBERGLASS MATERIALS

The invention comprises a lathe tool and tool-holder, for use in machining fiberglass materials, which uses router bits for machining the fiberglass, and which is capable of assuming an infinite number of working angles with respect to the fiberglass workpiece.

Figure 1 shows tool-post 10 for receiving shank 11 of the tool-holder. The other end of shank 11 is welded to lower cylindrical tool-holder 13, which is in turn welded to upper cylindrical tool-holder 14, forming an angle of approximately 30° therewith. The upper and lower cylindrical holders 14 and 13 respectively as shown in Figures 2, 3 and 4 are positioned in the same vertical plane and each defines a respective bore 16 and 15 in which the router bit may be inserted and locked. The positioning of upper and lower cylindrical holders 14 and 13, respectively, in the same vertical plane enhances the versatility of the tool-holder by permitting the machinist to select the holder most appropriate for the desired working angle. Further, the holder may be used in either a right or left-handed manner by reversing the position of the shank in the tool-post. With reference to Figure 3 of the drawings, upper and lower cylindrical holders 14 and 13 are coextensive in longitudinal length and the router bit may be inserted in either the right or left-handed ends thereof, further enhancing the multiplicity of working angles obtainable with the invention.

The novel features of this invention is the provision of two connected cylindrical tool-holders in the same vertical plane, connected in offset manner to a shank for mounting in the tool-post of a lathe tool, wherein router bits may be used. The combination provides an infinite number of working angles between bit and workpiece, enables the use of damaged router bits which might otherwise be discarded, and produces a smooth fiberglass end product.

Inventor: LaVern E. Winn
Employer: National Aeronautics and Space Administration
~~Evaluator: Clyde D. Hall~~
Serial No.: 219,436
Filing Date: 1/20/72

NASA CASE NO. KSC-10470

PRINT FIG. Figure 1

NOTICE

The invention disclosed in this document resulted from research in aeronautical and space activities performed under programs of the National Aeronautics and Space Administration. The invention is owned by NASA and is therefore available for licensing in accordance with the NASA Patent Licensing Regulation (14 Code of Federal Regulations 1245.200).

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Address inquiries and all requests for licenses to Assistant General Counsel for Patent Matters, Code GP-1, National Aeronautics and Space Administration, Washington DC 20546.

NASA CASE NO. XLA-10,470

NASA Case No. ~~XLA-10,470~~

TITLE OF THE INVENTION:

LATHE TOOL BIT AND HOLDER FOR MACHINING FIBERGLASS MATERIALS

INVENTOR:

LaVERN E. WINN

ORIGIN OF THE INVENTION:

The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

BACKGROUND OF THE INVENTION:

Field of the Invention

The invention relates to a lathe tool bit and holder for use in machining fiberglass materials which produces a smooth finish and does not burn the fibers. The holder uses carbide router bits as a lathe tool for machining the fiberglass and is capable of assuming an infinite number of working angles with respect to the fiberglass workpiece.

Description of the Prior Art

The prior art utilizes conventional carbide-tipped tool bits to machine fiberglass workpieces. Because of the hardness of fiberglass, it is known to select tool bits providing the best angular cut obtainable. The tool bits employed in the prior art normally produce unsatisfactory results, however, because the carbide tip has a tendency to tear or roughen the surface of the fiberglass workpiece during a cut. Consequently, in the prior art when a smooth and concentric surface is required, the fiberglass material has to be ground and, in many cases, finished by means of abrasive cloth or paper. These procedures are laborious and contribute materially to the amount of time and expense required to finish a given fiberglass workpiece.

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It is further known in the art to use lathe tool-holders with offset shanks. For example, note Hoffart patent 2,556,723 and Moras patent 829,081. The Moras patent in addition discloses that a cutting tool of any ordinary construction can be disposed in the tool-holder so as to cut either to the right or left by reversing the position of the shank and its offset relative to its position in the lathe. However, the number of working angles is limited.

SUMMARY OF THE DISCLOSURE:

These and other disadvantages of the prior art lathe tools and bit holders are solved by the instant invention which relates to a lathe tool and holder combination for machining resin-impregnated fiberglass cloth laminates. The unique tool-holder and tool-bit combination is designed to accommodate a conventional carbide-tipped, round-shank router bit as the cutting medium and provides an infinite number of cutting angles in order to produce a true and smooth surface in the fiberglass material workpiece with every pass of the tool-bit. In particular, applicant's invention utilizes router bits which have carbide tips and which, when properly ground, provide a keen and true cutting edge that produces excellent results when machining fiberglass. In addition, the interrelationship between the tool-holder and tool-bit functions to provide working angles which are not available in the prior art. In this regard, the working angle is the angle between the tool and the workpiece, and depends not only on the shape of the tool, but also on its position with respect to the workpiece. The described advantages of applicant's invention enable the machining of fiberglass material workpieces having smooth finishes.

the utilization of router bits which ordinarily would be discarded. That is, a damaged router bit can be easily adapted for use as a lathe tool-bit by shaving and sharpening the cutting edge of the undamaged flute. Further, since a router bit has two cutting edges, a single bit can be fashioned into a double-purpose lathe tool-bit by grinding each cutting edge to the desired shape, thereby enhancing its use and providing a multiplicity of working angles.

BRIEF DESCRIPTION OF THE DRAWINGS:

Figure 1 is a perspective view of the tool-holder and tool-bit features of applicant's invention mounted in a tool-post;

Figure 2 is a top plan view of the tool-holder according to applicant's invention showing the shank and the upper cylindrical tool-holder portion;

Figure 3 is a side elevation view of the tool-holder according to applicant's invention showing the positioning of the upper and lower cylindrical tool-holder portions in the same vertical plane with the shank portion of the tool-bit holder being welded thereto;

Figure 4 is a front elevation view of the tool-holder according to applicant's invention illustrating the upper and lower cylindrical tool-holder portions and their welded connection to each other and to the shank portion of the tool-holder.

DETAILED DESCRIPTION OF THE INVENTION:

Figure 1 shows the tool-holder and tool-bit combination according to applicant's invention wherein a router bit 19 having a carbide tip 20 is mounted in the upper cylindrical holder with the shank portion of the tool-holder being mounted in the tool-post of a lathe. Tool-post 10 defines a cavity through which shank 11 of the tool-holder is interfitted, and has associated

means (not shown) which are conventional in the art to securely mount shank 11 therein. The shank is substantially rectangular and is welded to the cylindrical holder portion 12 of the tool-holder.

In particular, Figure 1 shows lower cylindrical tool-holder 13 and upper cylindrical tool-holder 14 which are welded together by weld 18 as shown in Figure 4. Additionally, the shank 11 is welded to the cylindrical holder portion 12 as shown in Figures 2-4. With reference to Figure 2, it is seen that the rectangular shank 11 forms an angle of approximately 30° with the cylindrical portion 14. Further, with reference to Figures 2, 3 and 4, it is seen that the upper and lower cylindrical holders 14 and 13, respectively, are positioned in the same vertical plane, and each defines a respective bore 16 and 15 into which the router bit 19 may be fitted. For example, in Figure 1, the router bit 19 is fitted into upper cylindrical holder 14. Each of upper and lower cylindrical holders 14 and 13 is drilled and tapped as shown by designation numeral 17 to accommodate set screws 21 which securely fasten the router bit shank in the selected cylindrical holder. The set screws 21 provide the means of locking the router bit in position after it has been inserted in the selected cylindrical holder and adjusted to the desired cutting angle. However, the invention is not to be interpreted as limited to the use of such set screws, as other equivalent means may also be employed.

The tool-holder may be fabricated from a length of rectangular steel bar stock to form shank portion 11 and two lengths of cylindrical stock to form the cylindrical holder portion 12, these parts being welded together as shown. The bar stock, which forms the tool-holder shank 11, is sized to fit a standard engine-lathe tool-post as shown and is welded to the lower cylinder in a horizontal plane at approximately a 30° angle with the longitudinal axis of the cylindrical holder portion.

The positioning of upper and lower cylindrical holders 14 and 13, respectively, in the same vertical plane enhances the versatility of the tool-holder by permitting the machinist to select the holder most appropriate for the desired working angle. Further, the holder may be used in either a right or left-handed manner by reversing the position of the shank in the tool-post. With reference to Figure 3 of the drawings, upper and lower cylindrical holders 14 and 13 are coextensive in longitudinal length and the router bit 19 may be inserted in either the right or left-handed ends thereof, further enhancing the multiplicity of working angles obtainable with the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is: