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HANDLE AND MOUNTING FOR VIBRATORY TOOL

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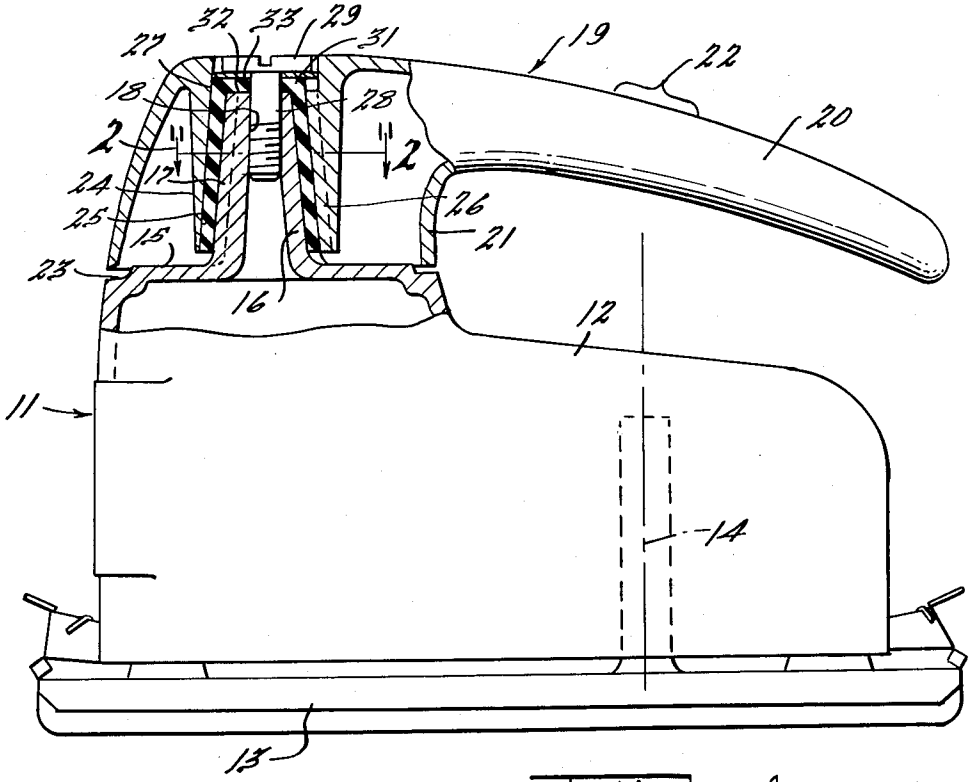


Fig. 1.

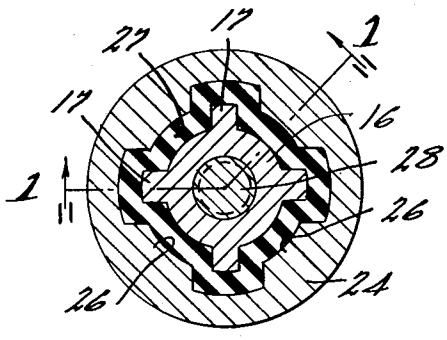


Fig. 2.

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HANDLE AND MOUNTING FOR VIBRATORY TOOL

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7 Claims. (Cl. 51—170)

This invention relates to handle constructions for vibratory tools, and in particular to a handle mounting means which enables easy manipulation of the tool with a reduction of noise and minimum of vibration transmitted to the hand of the operator.

It is an object of the present invention to provide a vibratory tool handle construction which minimizes the vibration in the hand portion of the tool without decreasing the efficiency of the mechanism, and which enables the tool to be easily manipulated during operation.

It is another object to provide an improved handle construction of the above nature which is of relatively simple construction, can be economically fabricated.

It is a further object to provide an improved handle construction of the above nature which is adaptable for various types of vibratory tools such as hand sanders, hand jig saws and the like.

Other objects, features, and advantages of the present invention will become apparent from the subsequent description, taken in conjunction with the accompanying drawings.

In the drawings:

Figure 1 is a side elevational view of a vibratory hand sander showing the improved handle construction of this invention, parts being cross-sectioned for clarity along the line 1—1 of Figure 2; and

Figure 2 is a cross-sectional view taken along the line 2—2 of Figure 1 and showing the spline construction and the disposition of the vibration-absorbing member.

The invention is adapted to be used with various types of vibratory tools, of which a hand sander 11 is shown for illustrative purposes. This hand sander may for example be of the general construction shown in copending application Serial No. 335,902 filed by Thomas F. Carmichael and Edward C. Sturgeon for Vibratory Power Tool and assigned to the assignee of the present application. The sander has a housing 12 and a vibratory platen 13 which holds a sandpaper sheet (not shown) and oscillates in its own plane about a vertical pivot axis 14. The supporting means for pivot axis 14 as well as the platen driving mechanism are not shown or described in detail, since they do not in themselves form part of the present invention. However, these parts are described in the above-mentioned co-pending application. The upper portion of housing 12 is provided with a platform 15 at one end thereof, and a standard 16 is formed as part of the housing and projects upwardly therefrom, the axis of standard 16 being spaced a substantial distance from pivot axis 14 of the sander platen. Standard 16 is preferably of tapered shape and has a plurality of vertical splines or ribs 17 spaced circumferentially thereon. The standard is also provided with an internal thread 18 for purposes described later. Mounted on standard 16 is a handle generally indicated at 19, the handle having a gripping portion 20 and an attaching portion 21 at one end thereof. Gripping portion 20, which is spaced a substantial distance from housing 12, is of elongated shape, and the handle is so disposed in its assembled position that the

central section 22 thereof is substantially aligned with pivot axis 14 of the sander platen. The attaching portion 21 is relatively wider than the gripping portion 20 and in the illustrated embodiment is of a hollow shell construction, although it will be understood that other constructions could be used within the principles of the invention. In particular, the open end of the hollow attaching portion 21 faces platform 15 and is coaxial with standard 16 of the housing, a recess 23 being provided at the periphery of platform 15 to accommodate the edge of the handle attaching portion. Extending within attaching portion 21 of the handle and integral therewith is a sleeve 24 which surrounds standard 16 when the handle is in assembled position. The interior surface 25 of the sleeve is flared outwardly in the direction of platform 15, and a plurality of axially extending spline projections 26 are formed on the inner surface and interfit with splines 17 on standard 16 in a manner described below.

Disposed between standard 16 and sleeve 24 is a vibration-absorbing member 27 which may be a tubular or sleevelike member of rubber or similar material. As shown, member 27 is of hollow elongated shape and is disposed between the sleeve and standard in such a manner that a substantial thickness of rubber appears at all points between the facing surfaces of these members. The relative dimensions of the splines are such as to accommodate the substantial rubber thickness while at the same time limiting relative rotational movement between these parts. It will be seen especially from an examination of Figure 2, that any vibrational movement of the standard 16, which of course is part of the housing, will be absorbed by the substantial thickness of member 27. At the same time, the shear strength properties of the vibration absorbing member will prevent undue rotation of the handle with respect to standard 16 which could result in undesired displacement of the handle. Member 27 when in its unstressed condition is preferably so shaped in cross-section as to properly fill the space between the splines of sleeve 24 and standard 16 and this preformed construction of the vibration-absorbing member further aids in preventing undue angular displacement of the handle.

Means are provided for securing handle 19 to the housing, and in the illustrated embodiment this means includes a screw fastener 28 the head 29 of which is disposed within the upper end of sleeve 24 and which threadably engages the threaded portion 18 of standard 16. A resilient washer-shaped member 31 is disposed between the head of screw 28 and the upper surface portion 32 of standard 16. In the present embodiment, member 31 is shown as being integral with elongated member 27, although these two members could be separate if desired. A metal washer 33 may be placed between the screw head and member 31 in order to allow rotation of the screw head without twisting member 31.

It will be noted, particularly in Figure 1, that the diameter of screw head 29 is somewhat smaller than the adjacent internal diameter of sleeve 24, so that there is no metal-to-metal contact which might cause noise through vibration. It will also be observed that the relative sizes of head 29 of the screw and splines 26 of sleeve 24 are such that these parts overlap. In this manner handle 19 is prevented from unwanted removal from housing 12, since it will be apparent that upward removal of sleeve 24 from standard 16 is not permitted as long as screw fastener 28 is in place.

The operation and advantages of the handle mounting and construction will be apparent from the foregoing description. During operation of the sander 11 the operator holds and guides the sander by grasping the grip-

ping portion 21 of handle 19, and the vibration of the platen 13 about vertical axis 14 will be transmitted to the housing 12 through the vibratory motor and attendant parts which need not be described in detail. The main vibratory forces impinging on housing 12 and therefore on standard 16 will be in a substantially horizontal direction since they consist of rotational and translatory forces parallel to the plane of movement of platen 13. These forces will cause compressive and shearing stresses to be set up within vibration-absorbing member 27, the latter serving to damp these forces so that a minimum amount of vibration is transmitted to handle 19. Due to the reduction of these vibrational forces and the absence of any metal-to-metal contact between the handle and housing, the assembly will also have a sound-deadening effect, greatly reducing the noises attending sander operation.

Since the central section 22 of gripping portion 21 of the handle is substantially in line with the axis of rotation 14 of platen 13, the effect on the operator of vibrations which are transmitted to the handle will be minimized. It will thus be seen that a handle and mounting construction has been provided which is especially adapted for minimizing the effects of vibratory tools on the guiding hand of the operator, thus affording a steadier and more accurate control of the tool.

While it will be apparent that the preferred embodiment of the invention herein disclosed is well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claims.

What is claimed is:

1. In combination, a tool having a vibratory member movable about an axis, a housing for said tool, a standard projecting from said housing, said standard having an axis spaced from said first-mentioned axis, a handle having an elongated gripping portion at one end and an attaching portion at the other end thereof, a sleeve on said attaching portion and surrounding said standard, the spacing of said axes being such that the intermediate section of said handle-gripping portion is substantially aligned with said first-mentioned axis, and a resilient member of substantial thickness disposed between said sleeve and standard.

2. The combination according to claim 1, said gripping portion on the handle being spaced a substantial distance from said housing.

3. The combination according to claim 1, said sleeve and handle carrying interfitting splined projections.

4. The combination according to claim 3, said resilient member being pre-shaped to conform to the space between said interfitting projections.

5. In combination, a vibratory tool having a member vibrating on an axis, a housing for said tool, a tapered standard projecting from said housing, said standard having external splined projections and an internal thread, a handle having an elongated gripping portion at one end and an attaching portion at the other end thereof, the intermediate section of said gripping portion being substantially aligned with said axis, said attaching portion including an outer shell having an open end facing said housing and an inner sleeve surrounding said standard, said sleeve being flared in a manner corresponding to said tapered housing, splined projections on said inner sleeve interfitting with said standard splined projections, a resilient member of substantial thickness disposed between said standard and sleeve, and a screw fastener threadably engaging said standard and having a head disposed within the narrow end of said sleeve, said head being in overlapping relation with the spline projections of said sleeve, whereby withdrawal of said sleeve from said standard is prevented.

6. The combination according to claim 5, further provided with a resilient member disposed between said screw fastener head and the adjacent ends of said sleeve spline projections.

7. In a combination, a tool having a vibratory member movable about an axis, a housing for said tool, a standard projecting from said housing, said standard having an axis in parallel spaced relation with said first-mentioned axis, a handle having an elongated gripping portion at one end and an attaching portion at the other end thereof, a sleeve on said attaching portion and surrounding said standard, and a resilient member of substantial thickness disposed between said sleeve and standard.

References Cited in the file of this patent

UNITED STATES PATENTS

1,791,798	Coen	Feb. 12, 1931
2,187,923	Winkleman	Jan. 23, 1940
2,441,506	Osman	May 11, 1948
2,441,766	Jardine	May 18, 1948