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Sibration-dampened holder for chiselling tools.

(57) A vibration-dampened holder for a chiselling tool comprises a gripping sleeve (10) which telescopically displaceably surrounds a shaft (20) which is detachably connectable to a tool (70), two helical springs oriented in the longitudinal direction of the rod and surrounding the rod, being connected by one end to the sleeve (10). The two springs (31, 32) are connected to the shaft (20) approximately midway along the length of the sleeve (10), and are prestressed with a force of about 7 kg, as well as having different spring constants. The sleeve (10) is secured against turning in relation to the shaft (20), and the rear spring (31) is arranged to be compressed approximately 150 mm from the unloaded state of the holder, upon an axial load of approximately 40 kg.



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The invention relates to a vibration-dampened holder for chiselling tools of the type described in the preamble to the appended claim 1.

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In the building branch irregularities in the form of fins, for instance, are trimmed between mould gaps in concrete ceilings, walls and floors by a trimming tool which may have the form of a compressed-air chisel, RRC 12 manufactured by Atlas Copco, for instance. Such trimming tools are usually supported by a shaft so that irregularities in 10 ceiling and floor can be chiselled away more conveniently. Ways of dampening the vibrations in such trimming tools have recently been suggested, by providing the shaft with a telescopic sleeve for the handle, said sleeve being connected to the 15 shaft by means of rubber bushings and being covered with dampening rubber.

Although such rubber bushings offer marked dampening of the vibrations transmitted to an operator holding the gripping sleeve, further improvement is still desirable to make the tool more convenient to work with and easier to manipulate.

One object of the invention is to achieve such a vibration-dampened holder for chiselling tools, particularly chiselling handtools.

The invention is based on a vibration-dampened holder for chiselling tools comprising a gripping sleeve which telescopically displaceably surrounds a shaft which is detachably connectable to the tool, said holder being characterised in that the sleeve is connected to the shaft by means of vibration-dampening elements in the form of two helical springs oriented in the longitudinal direction of the rod and being connected by one end to one end each of the sleeve and by the other end to the shaft, both springs being pre-stressed.

In a preferred embodiment the springs have different spring constants, the spring which is compressed when the tool is operated via the gripping sleeve being suitably stiffer than the other spring.

The springs are suitably pre-stressed towards each other with a force of about 5 kg, preferably about 7 kg.

The spring which is compressed upon operation of the tool is suitably arranged to be compressed approximately 150 mm from unloaded state, upon an axial load of approximately 40 kg. Such a holder offers excellent vibration dampening and "feels" very good. Since the tip of the tool is usually in the form of a flat chisel the sleeve should be secured against turning in relation to the shaft. However, to facilitate withstanding torsional moment a handle may be attached directed generally radially to the sleeve, which also facilitates control of the chisel blade in relation to the surface being chiselled. The shaft of the holder may be hollow and may be provided at both ends with connection means of standard type for compressed air, in which case the tool itself may be a compressed-air tool with a coupling enabling stable mechanical connection and air connection. An air hose can be connected to the rear end of the shaft. The shaft may also be provided with a radial pipe stub with a removable plug, between its front end and the front end of the gripping sleeve. An electric hand-tool can thus conveniently be used, the electric cable being drawn through the shaft and out through the pipe stub after removal of the plug. An attachment for an electrically operated tool may then be connected to the front coupling of the shaft and electrically connectable to the cable end passing through the pipe stub.

Surprisingly, it has been found that manual electric tools such as an electric drill with an output of about 400 W and with a chisel fitment attached have sufficient chiselling capability and are not troublesome to manipulate with a holder of the type described. This makes the holder easier to use since electricity is usually more easily available than compressed air. An additional advantage is noise associated avoidance of the with compressed-air tools.

The holder according to the invention may also preferably include a shaft extension which can be connected to the shaft. The shaft extension may also be in the form of a tube and be provided with compressed-air connections of conventional type offering stable mechanical connection and a tight connection to a compressed-air source.

The holder is often used for two different work operations: chiselling ceilings and chiselling floors. Different lengths of the holder are therefore desirable for the two operations and the shaft extension therefore suitably has a length corresponding to the desired difference in length for these two operations.

To further facilitate manipulation, the holder may be provided with a harness which can be worn by the operator. The harness may be in the form of a strap looped diagonally across the upper part of the operator's body from left shoulder to right hip, for instance. At its lower part, i.e. on a level with the wearer's waist or hip, the harness is provided with a connection element arranged to be connected to the rear end portion of the gripping sleeve, preferably via a pivot joint connected to the harness. This enables the operator to apply the tool more easily against the surface to be treated.

The invention is defined in the appended claims. The invention will be described in the following in the form of a currently preferred embodiment illustrated in the accompanying drawings.

shows, partially in section, a lateral Figure 1 view of the holder according to the invention.

Figure 2 shows a section along the line 2-2

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in Figure 1,

Figure 3	shows	а	section	along	the	line	3-3
	in Figure 1,						

- Figure 4 shows an attachment for an electrical tool which can be connected to the holder, and
- Figure 5 shows schematically a harness for the holder as worn by an operator.

Figure 1 shows a tubular shaft 20 of noncircular, e.g. quadratic cross section. The shaft 20 is surrounded by a gripping sleeve 10 which is telescopically displaceable along the shaft 20. The sleeve 10 is provided at each end with a permanently connected sliding bushing surrounding the shaft 20 with slight clearance.

In Figure 2 it can be seen that the sleeve has an outer casing 12 of vibration-dampening rubber surrounding a rigid sleeve 11. The sliding bushing 42 is formed by two bushing halves 43 which may consist of Delerin ^R, and is connected to the sleeve 11 by attachment elements 45 such as pins, leaving a slight clearance 44.

Two helical springs 31, 32 are placed around the shaft 20 between the two bushings 42 on the sleeve 10, and are pre-stressed to a common bushing 41 which is permanently connected to the shaft 20 by means of a weld 46, for instance. The spring 31 is somewhat stiffer than the spring 32. The springs 31, 32 are pre-stressed towards each other with a force of 7 kg. The springs are arranged so that upon operation of the tool 70, the sleeve 10 is displaced approximately 150 mm from rest position in relation to the shaft, upon an axial load of about 40 kg.

In the embodiment shown in Figure 1 the shaft 20 is provided with a through-cavity 21. The shaft 20 is also provided at its front end with a compressed-air coupling 60 of standard type enabling it to be connected to an equivalent compressed-air coupling 61' on a compressed-air tool 70, such as a chiselling tool RRC 12 manufactured by Atlas Copco.

As can be seen in Figure 1, the tool 70 may be connected to the shaft 20 via a shaft extension 80 which is also hollow and is provided at each end with standard coupling elements 60 and 61' for cooperation with the coupling elements 60 and 61'.

Between the coupling fitting 60 and the front end of the sleeve 10 the shaft 20 is provided with a pipe stub 23 with plug 24. If an electrically operated handtool is to be used instead of a compressed-air tool 70, the electric cable can be passed through the rear end 22 of the shaft 20 and out through the pipe stub 23, while a suitable attachment for a conventional electrically operated handtool may be provided with a coupling element 61 of the type used for compressed-air couplings. Such an attachment 71 is shown in Figure 4, with fittings 72, 73 for an electrically operated hand drill machine of pistol-grip type to which a conventional chisel insert has been added, can be used for trimming work.

To the left in Figure 1 an axial extension 50 of the sleeve 10 is also shown the rear part of the extension 50 being provided with a body 51 with an axially rearwardly directed recess 52, preferably with screw threading, and also a substantially radially directed recess 53, preferably provided with screw threading, for a corresponding dowel 55 on a handle 54 so that the handle 54 can be changed from axial to radial orientation if desired.

Figure 5 illustrates generally an operator with a harness 58 placed diagonally across the upper part of the body from left shoulder to right hip, for instance, the harness or loop 58 being sufficiently long to reach to the level of the wearer's hip. The strap 58 is preferably connected via a joint 57 to a pin 56 which can be fitted into one of the recesses 52, 53 on the tool holder itself.

The rear end of the shaft 20 can be connected to a compressed-air hose by a coupling element 22 if the tool 70 is a compressed air tool.

Claims

- 1. A vibration-dampened holder for chiselling tools (70), comprising a gripping sleeve (10) which telescopically displaceably surrounds a shaft (20) which is detachably connectable to the tool, **wherein** the sleeve (10) is connected to the shaft (20) by means of vibration-dampening elements in the form of two helical springs (31, 32) oriented in the longitudinal direction of the rod and being connected by one end to one end each of the sleeve (10) and by the other end to the shaft (20), both springs being pre-stressed.
- 2. A holder as claimed in claim 1, wherein the springs (31, 32) have different spring constants.
- **3.** A holder as claimed in claim 1 or 2, **wherein** the springs (31, 32) are pre-stressed towards each other with a force of about 5 kg, preferably about 7 kg.
- 4. A holder as claimed in any of claims 1-3, wherein the rear spring (31) which is compressed upon operation of the tool is arranged to experience a compression of approximately 150 mm upon an axial load of approximately 40 kg, in relation to the rest position of the holder.

5. A holder as claimed in any of claims 1-4,

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wherein a handle is detachably connected to the rear end portion of the sleeve, the rear end portion of the shaft (20) being located in the region between the rear end of the sleeve (10) and the handle (54).

- 6. A holder as claimed in any of claims 1-5, wherein the shaft (20) is tubular and provided at both ends with connection means (22,60) of standard type for compressed-air connections 10 and wherein, between its front end and the front end of the gripping sleeve (10), the shaft is provided with a radial pipe stub (23) with a removable plug (24).
- **7.** A holder as claimed in any of claims 1-6, **comprising** a shaft extension which can be connected to the front end of the shaft and which is provided with connection means (60') for connection of the tool.
- 8. A holder as claimed in any of claims 1-7, comprising a harness (58) which can be worn over the shoulder or round the neck of the operator and which reaches to the region of 25 the hip where it supports a connection element (56) arranged to be connected to the rear end portion of the sleeve (10).
- 9. A holder as claimed in any of claims 1-8, 30 wherein the shaft (20) has a non-circular, preferably quadratic external cross section and wherein the sleeve (10) is secured against turning in relation to the shaft (20) via two sliding bushings (42) connected one to each 35 end of the sleeve, the internal, exposed cross section of said bushings substantially corresponding to the external cross section of the shaft (20).
- 10. A holder as claimed in claim 7, comprising an attachment (71) for an electrically operated hand-tool, the attachment (71) being provided with a coupling element (61') connectable to an equivalent coupling element (60'; 60) on the front end of the shaft (20) or the shaft extension (80).
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EUROPEAN SEARCH REPORT

Application Number

EP 90 85 0419

	DOCUMENTS CONSIE	ERED TO BE RELI	EVANT		
Category	Citation of document with ind of relevant pass		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 5)	
X	US-A-1 362 657 (WHY * Page 1, line 106 - figures *		1,9	B 25 D 17/04	
X	US-A-1 451 102 (NEA * Page 1, lines 100- 	LE) 105; figures *	1		
				TECHNICAL FIELDS SEARCHED (Int. Cl.5)	
				B 25 D E 21 C	
	The present search report has be	-		<u> </u>	
TH	Place of search E HAGUE	Date of completion of the 03–07–1991		Examiner AND T.	
X:par Y:par doc	CATEGORY OF CITED DOCUMEN ticularly relevant if taken alone ticularly relevant if combined with anot ument of the same category hnological background n-written disclosure	E : earlier after ti her D : docum L : docum	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		