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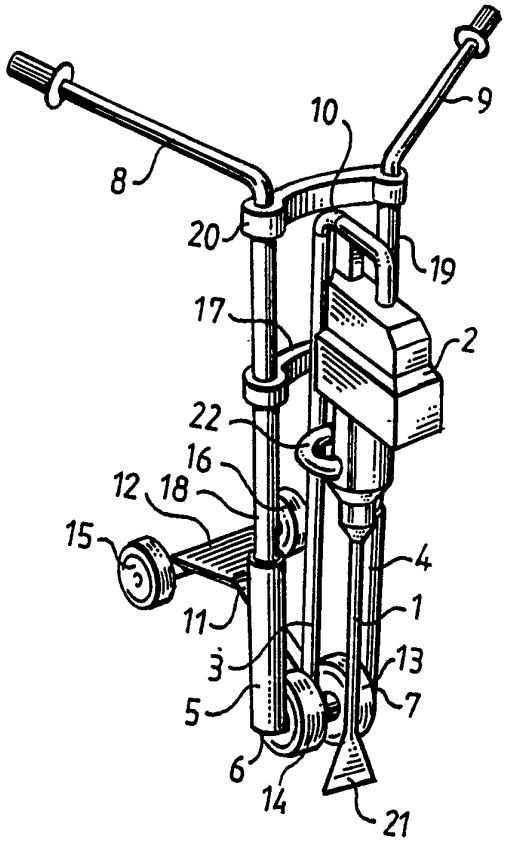
(54) Title: HOLDING DEVICE

(57) Abstract

The present invention is for a holder for a device comprising axially vibrating and/or beating tools, e.g. a device for removal of hard layers by axing using an axially vibrating and beating chisel. The device is manually controlled and transfer of vibrations and beats from the chisel to the handles is eliminated or much reduced by shock absorbers which are arranged parallel to the chisel. The chisel and its power machine are mounted onto one with the shock absorbers parallel fastening means which is connected to the lower ends of the shock absorbers. The device also comprises a backward support so that in operation it does not need to be held in position but only directed.



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Holding device

The present invention is for a holder for a device having axially vibrating and/or beating tools, e.g a device for removal of hard layers by axing using a mainly axially vibrating and/or beating chisel.

By axing one uses a chisel to cut away layers and material from a bedding. Axing is used in the building business by repair and maintenace work. By repair and maintenance of floors old floor material or floor beds must be removed. This bed can be e.g. concret, so-called fluid putty or the like. For this purpose are used chisels, the working edges of which have a width of about 100 mm and where the length of the chisel together with its vibration generating power machine is about 1 m. This unit is intended to be held by hand during working. As the material which shall be removed often is hard and strong and difficult to separate from its bedding, forceful vibrations together with beating of the chisel is required. This is obtained by using a power machine which is driven by a suitable motor which in the case of building work or other work which are fully or partly done indoor, suitably is en electric motor. The vibrating and beating of the machine brings with it considerable physical strains for the person doing the work and may bring with it temporary as well as chronical injuries. It also means that the time during which continuous work can be performed is very limited.

In order to reduce the incoveniences when using this kind of machines various measures have been tried primarily concerning the design and material of the handles. It has been tried to achieve that the handles which are directly fastened on to the power machine shall be resilient or elastic e.g. by making them from rubber with for the purpose suitable properties. Even though certain improvements have hereby been achieved the results are far from satisfactory. In order to obtain the best

result of the work and as rapid axing of the material to be removed as possible, it is important that beating and vibrations have the correct power and frequency. Also these factors are influenced by how the tool is handled by the operator, e.g. by the force with which the tool is forced against the floor.

One objection of the present invention is to avoid that beating and vibrations is transferred from the machine to the operator. Another object of the invention is to obtain an ergonomically correct position of working which means that the operator can do his job standing with a straight back. Another object of the invention is to obtain a better function of the tool by achieving constant conditions of work. A device according to the invention compries one or more shock absorbers which are essentially parallel with the axial direction of the chisel, whereby the transfer of the movements of the tool to the handles are in principle eliminated and injuries caused by vibrations are avoided.

The invention shall below be described more closely in connection with the embodiment shown in the figures.

Figure 1 shows a device according to the invention with axing chisel, power machine and holding device with handle.

Figure 2 shows the holding device with handle and support details.

Figure 3 shows a section through the device of figure 1.

Figure 4 shows a section of the holding device along the line A - A.

The device shown in figure 1 comprises an axing chisel 1 which at its lower end has a perpendicular edge 21. The chisel is attached to a power machine 2 of conventional kind which is

powered by an electric motor. The device is attached to the holding means 3 by a fastening means 22 and an upper fastening device 10 which may also include vibration damping elements of conventional kind, e.g. rubber bushings. The holding means 3 is at its lower end movably connected to the lower ends of two with the fastening means parallel shock absorbers 4, 5, so that the fastening means can turn around a shaft between the shock absorbers. The upper parts 18, 19 of the shock absorber are held together by means of two struts 17, 20. At the top of the shock absorbers two handles 8, 9 are mounted. In order to hold the shock absorbers 4, 5 in a position which is essentially parallel with the fastening means 3, there is as shown in figures 3 and 4 a connection between the power machine 2 and the strut 17 which consists of a spring or a soft rubber bushing, preferably a coil spring which does not transfer the movements of the power machine to the handle. The device also has a backwardly directed strut 11 which ends with short perpendicular shaft onto which two wheels 15, 16 are mounted. The backwardly directed strut 11 is in operation stiffly connected to the fastening means 3. The shape of the strut may vary as may also its mounting onto the fastening means and the strut may for transportation and storing purposes be movably connected to the fastening means and foldable against this. Between the wheels there may also be a support plate 12. The shaft between the lower ends of the shock absorbers which also carries the fastening means 3 is also a wheel shaft and carries two wheels 13 and 14. The fastening of the tool to the fastening means is so designed that the angle of the tool towards the fastening means is adjustable and therewith also the angle of the tool towards the floor which is important among others for the efficiency of axing jobs.

When the device is to be used it is adjusted so that the edge 21 of the chisel and the two back wheels 15 and 16 rest onto the floor. Hereby the axis of the chisel and the fastening means parallel therewith and the shock absorbers shall be slightly backwards inclined as shown in figure 3. The chisel

and the shock absorbers are essentially parallel to each other but may also be positioned so that there is a small angle between them as shown in figure 3. In order to obtain this the fastening of the power machine is adjustable relative to the shock absorbers and the handles thereby that the fastening means 3 comprises a lower part and thereupon a movable upper part which carries the fastening means 10 and 22. The upper part may be displaced axially on the lower part and locked in a position as wanted. It can be so adjusted that when the specified depth of axing has been obtained also the front wheels 13, 14 are in contact with the floor.

CLAIMS

1) Holder for a device having axially vibrating and/or beating tools, e.g. for removing of hard layers by axing using an axially beating and vibrating chisel, characterized in that it comprises a fastening means (3), onto which the tool (1) and its power machine (2) are mounted, one or more shock absorbers (4, 5) positioned essentially parallel with the tool and with their upper ends carrying handles (8, 9) for the operation of the device and where the lower ends are connected to the fastening means.

2) Holder according to claim 1, characterized in that the fastening means (3) is movably connected to the shock absorbers (4, 5) so that the fastening means may turn around the shaft which is positioned between the lower ends of the shock absorbers.

3) Holder according to claim 1 or 2, characterized in that the handle and the fastening means are also connected to each other with the resilient connection (10) which does not transfer vibrations.

4) Holder according to any of the preceding claims, characterized in that it comprises a strut (11) which extends backwards from the fastening means (3).

5) Holder according to any of the preceding claims, characterized in that the fastening means for the power machine is adjustable on the fastening means relative to the shock absorbers so that the device supports on to the floor, either with the edge (21) of the chisel (1) or with support means, e.g. wheels (13, 14), which are arranged on the shock absorbers.

Fig. 1

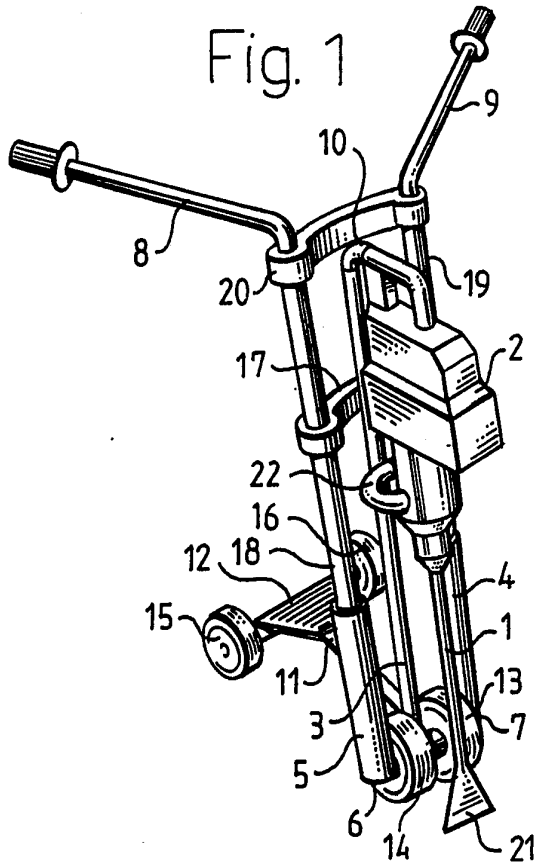


Fig. 2

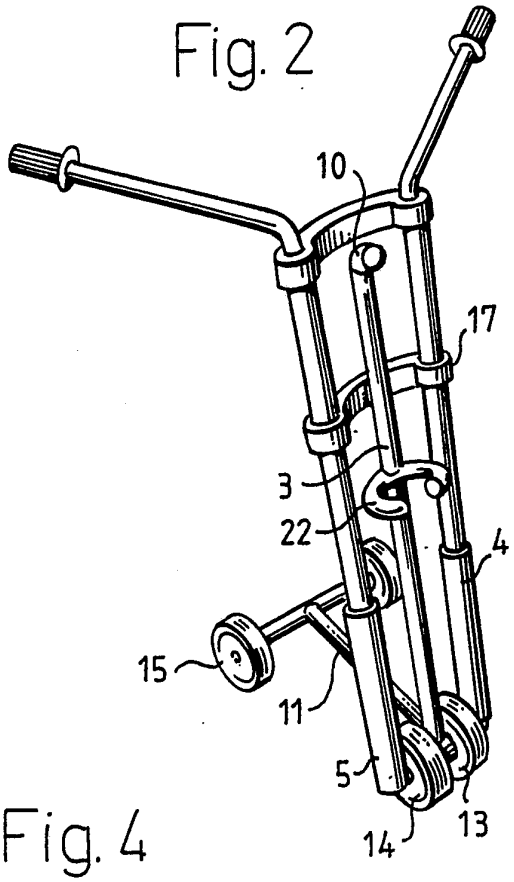


Fig. 3

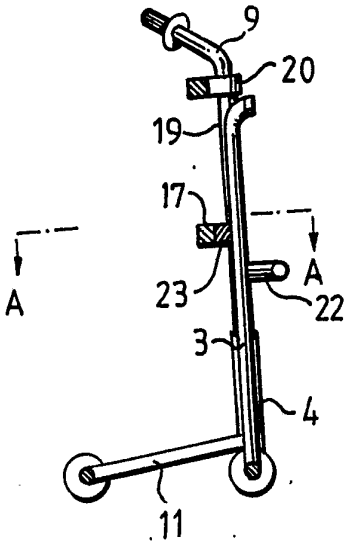
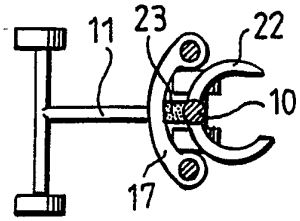


Fig. 4



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 92/00507

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC5: B25D 17/28

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
IPC5	B25D; E21C

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched[8]

SE,DK,FI,NO classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category *	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
A	SE, B, 379165 (Å L SJÖBERG) 29 September 1975, see figures 1,2 and the following details; the tool (5), the slide (7-11), the springs (13 and 15), the handle (4) and the rubber ring (26). Notice the pedal (16) connected to the adjustment spring 15. --	1,3
A	US, A, 2904320 (M.B. SALISBURY ET AL) 15 September 1959, see figure 3, detail 39, and column 3, line 4-14 --	2
A	US, A, 1898369 (A.F. HOHMANN ET AL) 21 February 1933, see the supporting arms (40 and 41) --	4

* Special categories of cited documents:[10]

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"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
14th September 1992	17 -09- 1992
International Searching Authority	**Signature of Authorized Officer**
SWEDISH PATENT OFFICE	Maria Lundström

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
A	GB, A, 2092938 (BRITISH STEEL CORPORATION) 25 August 1982, see the whole document --	1

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. PCT/SE 92/00507

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the Swedish Patent Office EDP file on 28/08/92
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SE-B- 379165	75-09-29	NONE	
US-A- 2904320	59-09-15	NONE	
US-A- 1898369	33-02-21	NONE	
GB-A- 2092938	82-08-25	DE-A- 3205300	82-09-16