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(56) Documents Cited:
GB 2433284 A
GB 2374103 A
GB 2258483 A
GB 2102054 A
GB 2389614 A
GB 2310236 A
GB 2209044 A

(58) Field of Search:
INT CL **E01C**
Other: **ONLINE:WPI,EPODOC**

(54) Title of the Invention: **Levelling aid for laying paving slabs**
Abstract Title: **Levelling aid for laying sub-layer of paving**

(57) The levelling aid, primarily for use when preparing a dry sand-cement sub-layer for paving or patio slabs or tiles, comprises an upper portion 1 with a lower surface for engaging a paving slab or the like and an offset portion 2 attached to the upper portion so that the axes of the upper and offset portions are parallel to one another, with a lower surface of the offset section being offset below, in use, the lower surface of the upper portion. The offset is preferably adjustable. The upper section may include a spirit level 1a or digital inclinometer and the device may also include a vibrator. An adjustable foot 1b may protrude from the lower surface of the upper section. The lower surface of the offset section may be provided with uniform open channels with axes at right angles to the longitudinal axes of the upper and offset sections.

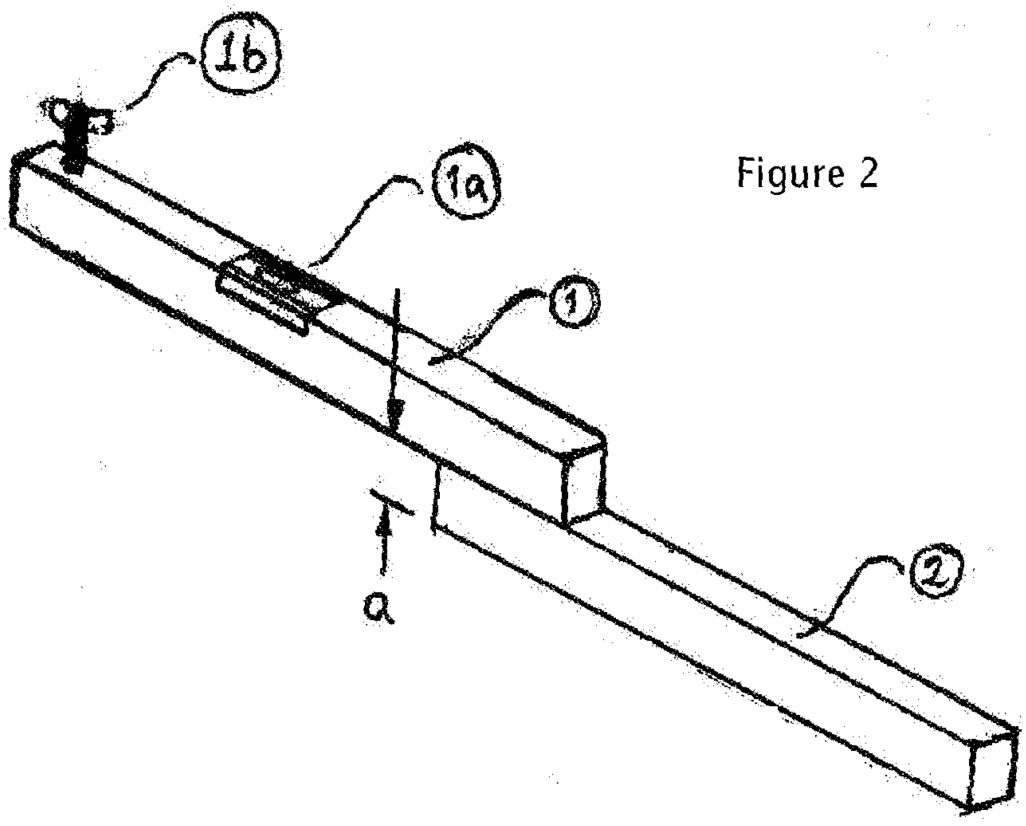

Figure 2

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Drawings

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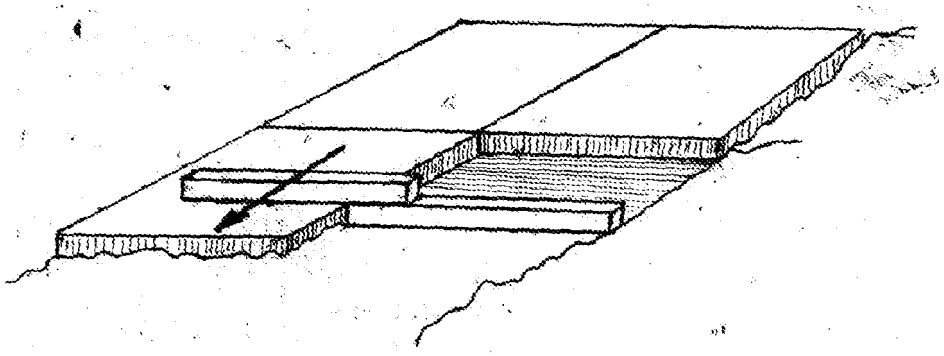

Figure 1

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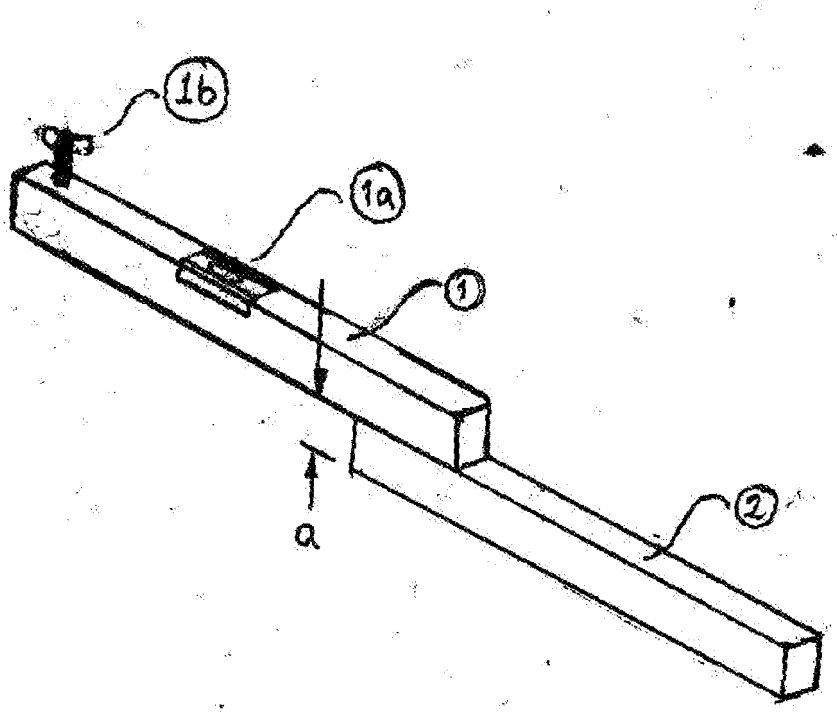

Figure 2

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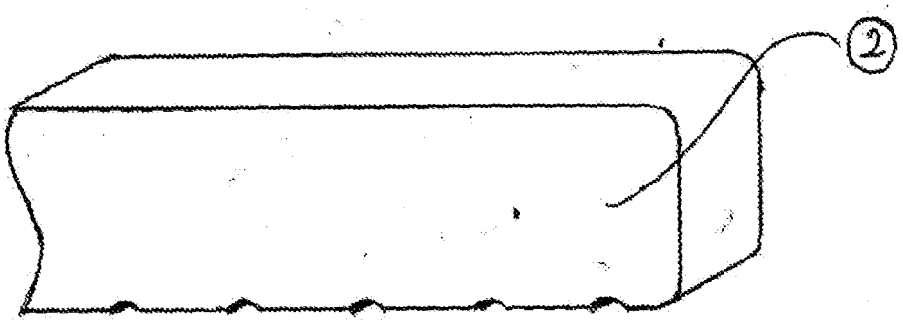

Figure 3

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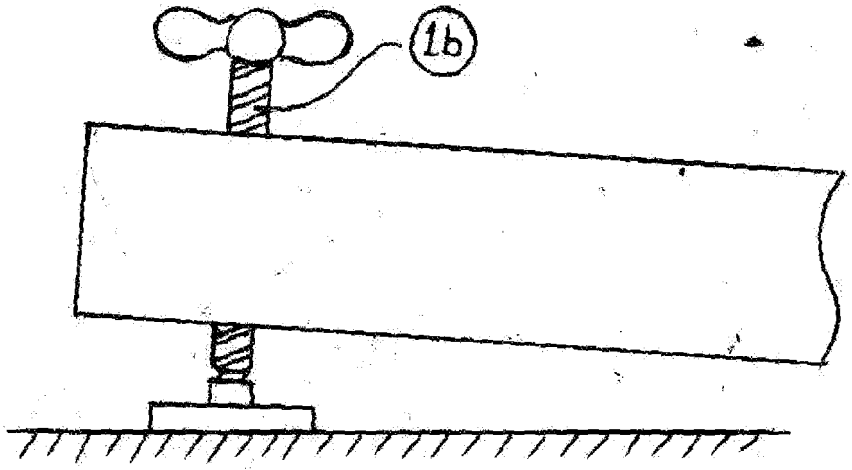

Figure 4

Description

This invention is for facilitating the laying of patio or paving slabs. There are a variety of methods for preparing the supporting sub-layer of patio or paving slabs, one very common method is using a dry sand-cement mix for which this device has been developed.

The typical starting point for the laying of a paved area is to decide the height of the upper surface of the area as well as the run-off angle (to direct rainfall to a specific place relative to the paved area). Once this has been established an initial slab (or slabs at each corner of the area to be paved) are laid. Once in position adjacent slabs need to be laid in the same plane as the reference slab(s).
The device simply uses the upper surface of a reference slab to prepare the dry sand-cement mix for the adjacent slab. This is done by slightly overfilling the adjacent area with dry sand-cement mix and then pressing the device down onto the surface of the reference slab the offset of the device pressing down onto the surface of the dry sand-cement mix, by dragging the device across the surface of the reference slab the dry sand-cement mix will be levelled in an offset plane parallel to the reference slab (see figure 1).

In trials with slabs of dimension 450mm x 450mm x 50mm the time in preparing the dry sand-cement mix was reduced to 30-35% of that when preparing with a rake. The overall time reduction was somewhat better than 30% due to the device providing accurate 'first time' positioning of each slab.

In greater detail the device (figure 2) comprises two main parts, the upper section (1) which is gripped by hand and the offset section (2), the lower surface of which acts on the dry sand-cement mix to level and compress it. The offset distance (a) could be adjustable for different thickness of slabs or simply fixed to a level which corresponds to a typical slab thickness. This offset distance may be configured to be slightly less than the slab thickness to provide allowance for the compression of the sand cement mix. Alternatively features providing the same allowance for the compression of the dry sand-cement mix would be a series of reliefs in the lower surface of the offset section (2) which in turn creates series of raised features in the dry sand-cement mix (figure 3).

In another embodiment of the invention, section (1) could contain a spirit level (1a) for initial setting of the reference slab and continual checking of the run-off angle. A further embodiment may have the offset section (2) as detachable from the upper section (1), where the upper section (1) comprises the main element of the device and a range of detachable offset sections (2) could be supplied depending on the size and thickness of the slabs being laid.

A further additional simple feature is a screw adjusted foot (1b) at the end of the upper section (1) which allows the preparation of the dry sand-cement mix to be prepared at an angle to the plane of the adjacent slab. This is a useful feature when making small corrections or designing into the entire paved surface a water run-off path to an adjacent drain or area with plants. The foot arrangement would retract fully to become flush with the lower surface of the offset section (2), the foot being circular in geometry and attached to the bottom of the screw thread by a ball and socket to allow full articulation. This ensures that the foot can be dragged over the surface of the reference slab with full contact of the bottom of the foot with the surface of the slab (see figure 4.) The screw adjuster (1b) may additionally require a locking device such a lock nut on the upper surface of the upper section (1) which could lock the adjuster in place.

In use the device works efficiently to level and compact the dry sand-cement mix when moved in small backwards and forwards movements, to provide a measure of automation and consistency of this movement the device may benefit from an integrated vibrator (battery powered or mechanically driven via a wind-up spring).

Claims

1. A levelling aid for the preparation of a dry sand-cement sub-layer for the laying of paving, patio slabs or floor tiles comprising:

   a first upper section with a flat lower surface,

   a second offset section, attached to the upper section with their longitudinal axes aligned, with a flat lower surface parallel to the plane of the lower surface of the upper section with an offset to the parallel plane of the first upper section .

2. A device according to claim 1 where the offset is adjustable.

3. A device according to claims 1 and 2 where the upper section contains a spirit level or digital inclinometer.

4. A device according to claims 1 to 3 where the lower surface of the offset section contains uniform open channels, the axis of the channels being at right angles to the longitudinal axis of both the upper and offset sections.

5. A device according to claims 1 to 4 which incorporates an adjustable foot which protrudes from lower surface of the upper section.

6. A device according to claims 1, 2, 3 & 5 or 1, 2, 4 & 5 which incorporates a vibrator.

7. A device substantially as described herein with reference to the accompanying drawings

Application No:	GB1107750.0	**Examiner:**	Mr Charles Jarman
Claims searched:	1-7	**Date of search:**	18 August 2011

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-4, 6	GB2433284 A (CUTLER ET AL) See whole document.
X	1-4, 6	GB2389614 A (MCGINLAY) See whole document.
X	1-4, 6	GB2374103 A (GAMMELL) See whole document.
X	1-4, 6	GB2310236 A (ROBINSON) See whole document.
X	1-4, 6	GB2258483 A (GREEST PRODUCTS LIMITED) See whole document.
X	1-4, 6	GB2209044 A (GOSS) See whole document.
X	1-4, 6	GB2102054 A (CAPELL) See whole document.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

E01C

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC

International Classification:

Subclass	Subgroup	Valid From
E01C	0019/15	01/01/2006