Abstract: Hand tool (101) comprising a tool support (102) on which a handle device is arranged for manually bringing the tool support (102) against and along a surface to be shaped using the tool support (102), where the side (109) of the tool support (102) facing away from the handle device is plane. The invention is characterised in that the handle device comprises at least two elongated handles (104) extending out from the tool support (102), whereof at least one handle is pivotally arranged in relation to the tool support (102).
HAND TOOL COMPRISING A TOOL SUPPORT

The present invention relates to a manual hand tool comprising a flat tool support, used for working on a surface using a handle arranged at the tool support. Such hand tools are, for example, used during distribution of various types of viscous coatings on supporting surfaces, such as distribution of adhesive during tile installation or distribution of grout during jointing. Moreover, such hand tools are common during for example grinding and washing of a surface.

During such works, the work support is typically held by the handle, pressed against and brought along the surface. Many work operations demand careful working over large areas, for example using repeated diagonal motions across the supporting surface back and forth. Prolonged such work can result in repetitive strain injury in hands and arms.

The present invention solves the above described problems of poor ergonomics during such works.

Thus, the invention relates to a hand tool comprising a tool support on which a handle device is arranged for manually bringing the tool support against and along a surface to be shaped using the tool support, where the side of the tool support facing away from the handle device is flat, and is characterised in that the handle device comprises at least two elongated handles extending out from the tool support, whereof at least one handle is pivotally arranged in relation to the tool support.
In the following, the invention will be described in detail, with reference to exemplifying embodiments of the invention and to the attached drawings, where:

Figure 1 is a perspective view illustrating a conventional hand tool;
Figure 2 is a perspective view illustrating a hand tool according to the present invention; and
Figures 3a-3d illustrate in perspective four different preferred embodiments of the present invention.

Figure 1 illustrates a hand tool 1 which is conventional as such, comprising a handle 3 and a tool support 2. During use, the tool 1 is held using the handle 3, and is pressed against the supporting surface at the same time as the tool 1 is pulled back and forth. This creates large strain in the hand and arm of the user, over time possibly resulting in repetitive strain injury.

Figure 2 shows a hand tool 101 according to the present invention, likewise comprising a tool support 102, the intention of which is to be pressed against and brought along a supporting surface. In contrast to the conventional hand tool 1, the hand tool 101 however comprises at least two elongated handles 104, 105, extending from the tool support 102. Furthermore, one or several of the handles 104, 105 are pivotally arranged in relation to the tool support 102, which in figure 2 is illustrated by arrow A. It is also possible in some embodiments to use more than two, pivotally arranged or non-pivotally arranged, handles extending out from the support 102.
The hand tool 101 is intended for manual shaping of an essentially plane surface such as a floor, a wall or a ceiling, and is not electrically or otherwise driven using a power source except for the muscle power of the user. In other words, the hand tool 101 is not a motor driven tool of the type compass saw, motorized grinding machine or the like.

The two pivotally arranged handles 104, 105 are fastened to the tool support 102 using a respective fastening means 106, 107. The fastening means 106, 107 are arranged at one respective location on the tool support 102, along an imaginary line which runs in parallel to one of the main directions of extension of the tool support 102. Moreover, the hand tool 101 also comprises a fixed handle 103 extending between the handles 104, 105.

In the preferred embodiment illustrated in figure 2, the handles 103, 104, 105, together with the fastening means 106, 107, form a handle device connected to the tool support 102. The fixed handle 103 provides for more flexibility for the user to switch grips as the work proceeds, which results in further improved ergonomics. It is preferred that the fixed handle 103 extends between the two respective fastening means 106, 107. This achieves a simple, cheap and robust construction.

The tool support 102 comprises a plane lower side 109, i.e. the side facing away from the handle device and arranged to abut the surface during work.

It is furthermore preferred that, as is the case in the embodiment shown in figure 2, the fixed handle 103 comprises a grip part 108 running above the upper side of the tool sup-
port 102, in parallel to both one of the directions of extension of the tool support 102 and to the plane lower side 109 of the tool support 102, as well as at a distance from the tool support 102.

The arrangement with two handles 104, 105 achieves that the user can use both hands simultaneously for optimal maneuvering of the tool 101, which significantly improves ergonomics as compared to conventional hand tools of the same type, especially since one of the handles 104, 105 can be pivoted. With the same purpose, it is furthermore preferred that all handles 104, 105 extending out from the support 102 are arranged to be unlimitedly rotatably arranged independently of each other, and also freely and unlimitedly rotatably arranged across all angles of rotation in relation to the tool support 102.

According to a preferred embodiment, the handles 104, 105 extend away from the tool support 102 substantially perpendicularly to the plane lower surface 109 of the tool support 102. For some applications, it may on the other hand be suitable to arrange a pivotally arranged or non-pivotally arranged handle extending away from the tool support 102 in a direction which is not perpendicular to the lower surface 109. As an example, a hand tool can comprise two handles, one of which is pivotally arranged and arranged perpendicularly to the lower surface 109, and the other non-pivotally arranged and arranged with an angle so that it is inclined away from the first pivotally arranged handle.

It is preferred that one or several pivotally arranged handles pivotally engage with their respective fastening means, where the engagement defines the freedom of motion of the
handle in relation to the tool support 102. According to a preferred embodiment, one or several pivotally arranged handles are pivotally arranged about an axis which is not parallel to the plane lower surface 109 of the tool support 102, preferably about an axis which coincides with the main direction of extension of the respective handle. It is especially preferred that at least one pivotally arranged handle is arranged with a main direction of extension which is essentially perpendicular to the plane lower surface 109 of the tool support 102 and that this handle is pivotally arranged about an axis which essentially coincides with this direction of extension, and which thus is also essentially perpendicular to the lower surface 109 of the tool support 102. Such arrangement achieves good ergonomics.

According to a preferred embodiment, the tool 101 comprises two elongate handles 104, 105 that are both freely rotatably arranged about an axis which is perpendicular to the plane lower surface 109 of the tool support 102, which achieves good ergonomics.

Figures 3a-3d illustrate preferred modifications 201, 301, 401, 501 of the hand tool 101 for use during various work operations.

In figure 3a, the plane lower surface 209 of the work support 202 is coated with a plane rubber plate 206, for use during distribution of viscous materials, such as adhesive, on a surface.

In figure 3b, a sponge 306 is instead fastened to the plane lower surface 309 of the tool support 302. In this case, the
hand tool 301 is arranged to be used during washing of a surface.

In figure 3c, an abrasive paper 406 is fastened to the plane lower surface 409 of the tool support 402, whereby the hand tool 401 is arranged to be used during grinding of a surface.

According to a preferred embodiment, the plane lower surface 109, 209, 309, 409 of the tool support 102, 202, 302, 402 is provided with a fastening device (not shown) for exchangeable tools. In this way, one and the same hand tool can be used for several different work operations, such as tiling, jointing, washing, grinding, etc., by selecting tools among for example a rubber plate 206, a sponge 306, an abrasive paper 406 or a toothed putty knife. Moreover or alternatively, wear parts of the type abrasive paper 406 and the like can easily be replaced when needed.

Preferably, the fastening device is comprised by co-acting fastening means, on the one hand at the lower side 109, 209, 309, 409 of the tool support 102, 202, 302, 402, on the other hand at that side of each respective tool which is arranged to abut the lower side 109, 209, 309, 409 of the tool support 102, 202, 302, 402, and can be conventional as such, as in the form of VELCRO® fastener or snap locks.

In figure 3d, an alternative embodiment is illustrated, in which the tool support 502 itself comprises tooth means 506, so that the tool support 502 in itself constitutes a toothed putty knife suitable for use during application of viscous materials, such as adhesive, on a supporting surface, especially during tiling.
In a way which is similar to the one shown in figure 3d with fixed teeth means 506, the tool support 102 can be designed with other permanently fixed and non replaceable tools of the type rubber plate, sponge, abrasive paper or the like for use during various work operations.

Above, preferred embodiments have been described. However, it is apparent to the skilled person that many modifications may be made to the described embodiments.

For example, a tool support 502 provided with teeth means 506 can be provided with a fastening device of the above described type, so that the hand tool 501 can be used for distribution of adhesive in case no tool is mounted.

Thus, the invention is not to be limited by the described embodiments, but may be varied within the scope of the enclosed claims.
 CLAIMS

1. Hand tool (101;201; 301; 401; 501) comprising a tool support (102;202;302;402;502) on which a handle device is arranged for manually bringing the tool support (102;202;302;402;502) against and along a surface to be shaped using the tool support (102;202;302;402;502), where the side (109;209;309;409) of the tool support (102;202;302;402;502) facing away from the handle device is flat, and where the handle device comprises at least two elongate handles (104;105) extending out from the tool support (102;202;302;402;502), characterised in that at least one of the handles is pivotally arranged about an axis which is perpendicular in relation to the flat side (109;209;309;409) of the tool support (102;202;302;402;502).

2. Hand tool (101;201; 301; 401; 501) according to claim 1, characterised in that the hand tool (101;201;301;401;501) comprises two elongate handles (104;105) which are both freely rotatably arranged about an axis which is perpendicular to the flat surface (109;209;309;409) of the tool support (102;202;302;402;502).

3. Hand tool (101;201; 301; 401; 501) according to any one of claims 1-2, characterised in that at least one of the elongate handles (104;105) is pivotally arranged in relation to the tool support (102;202;302;402;502) about an axis which is parallel to the main direction of extension of the handle (104;105).

4. Hand tool (101;201; 301; 401; 501) according to any one of the preceding claims, characterised in that the hand tool (101;201;301;401;501) further comprises a handle.
which is fixed in relation to the tool support (102; 202; 302; 402; 502).

5. Hand tool (101; 201; 301; 401; 501) according to claim 4, characterised in that the fixed handle (103) comprises a grip part (108) running in parallel to both one of the directions of extension of the tool support (102; 202; 302; 402; 502) and to the flat side (109; 209; 309; 409) of the tool support (102; 202; 302; 402; 502), as well as at a distance from the tool support (102; 202; 302; 402; 502).

6. Hand tool (101; 201; 301; 401; 501) according to claim 5, characterised in that the two pivotally arranged handles (104; 105) are fixed to the tool support (102; 202; 302; 402; 502) at one respective location each, so that the fastening locations are arranged along an imaginary line on the tool support (102; 202; 302; 402; 502) which is parallel to one of the main directions of extension of the tool support (102; 202; 302; 402; 502), and in that the fixed handle (103) extends between the two pivotally arranged handles (104; 105).

7. Hand tool (501) according to any one of the preceding claims, characterised in that the tool support (502) constitutes a teethed putty knife, whereby the hand tool (501) is arranged for use during application of viscous materials, such as adhesive, on a surface.

8. Hand tool (201) according to any one of claims 1-6, characterised in that the tool support (202) comprises a rubber plate (206) arranged at its plane side (209), whereby the hand tool (201) is arranged for use during distribution of viscous materials, such as grout, on a surface.
9. Hand tool (301) according to any one of claims 1-6, characterised in that the tool support (302) comprises a sponge (306) arranged at its plane side (309), whereby the hand tool (301) is arranged for use during washing of a surface.

10. Hand tool (101;201; 301; 401; 501) according to any one of claims 1-7, characterised in that the tool support (102;202;302;402;502) comprises a fastening device for exchangeable tools arranged at its plane side (102;202;302;402;502).

11. Hand tool (101;201; 301; 401; 501) according to claim 10, characterised in that the exchangeable tool is an abrasive paper (406).
INTERNATIONAL SEARCH REPORT

International application No
PCT/SE2010/050466

A CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both national classification and IPC

B FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC:B05C, B25G, E04F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
SE, DK, Fi, NO classes as above

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Further documents are listed in the continuation of Box C. See patent family annex.

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