Abstract Title: Free Standing Frame with Fan

A free standing frame (10) includes first and second parts (11, 12) each having an in use, upper end (11c, 12c) and a lower end (11d, 12d), the first and second parts (11, 12) being connected together to permit the parts to be moved from a first, fully closed condition in which the lower ends (11d, 12d) of the first and second parts (11, 12) are close together and a second fully open condition in which the lower ends (11d, 12d) of the first and second parts (11, 12) are spaced apart to enable the frame (10) to be supported on a support surface (14), and wherein the first and second parts (11, 12), at least when in the second fully open condition, mount a fan structure (20) which includes a rotatable impeller (21) which in use is operative to move air over the support surface (14). Preferably, such a frame is used during floor cleaning to aid floor drying and to carry a warning message that the floor is slippery.
Title: Free Standing Frame

5 Description of Invention

This invention relates to a free standing frame and more particularly but not exclusively to a free standing "A" frame of the kind having a pair of parts which are pivotally connected, usually towards in use, upper ends of the parts. The first and second parts are moveable from a first closed condition for stowage in which the parts are folded together, to a second in use condition, in which the parts are moved apart at their, in use, lower ends to provide a wider base so that the frame can be stood on a support surface.

15 Such a frame is typically used by a janitor during floor cleaning, at least one of the first and second parts or an attachment to one or other of the parts, carrying a message such as a warning that the floor may be slippery.

According to a first aspect of the invention I provide a free standing frame which includes first and second parts each having an in use, upper end and a lower end, the first and second parts being connected together to permit the parts to be moved from a first, fully closed condition in which the lower ends of the first and second parts are close together and a second fully open condition in which the lower ends of the first and second parts are spaced apart to enable the frame to be supported on a support surface, and wherein the first and second parts, at least when in the second fully open condition, mount a fan structure which includes a rotatable impeller which in use is operative to move air over the support surface.

30 Providing the frame of the invention with the fan structure which moves air over the support surface, enables the frame when the first and second parts
are in the fully open condition to promote floor drying in the vicinity of the frame.

Floor drying apparatus are known, such as for example from US2007/0157485, but this apparatus, being dedicated to drying cannot be readily stowed as can a frame in accordance with the present invention, by closing the first and second frame parts. Moreover the apparatus the subject of US2007/015485 has wheels which engage the floor to be dried whereas in the present invention, the frame is supportable on the support surface either by the lower ends of the first and second parts sitting on the support surface, or more preferably by feet provided by the first and second parts, which may provide a four point support. With the frame of the present invention which does not have wheels, there is no risk of the frame migrating from where it placed on the support surface, due to operation of the fan.

In the frame of the invention, when the first and second parts are closed together, the fan structure may be stowed between the first and second parts, for example by being folded relative to the first part. To achieve this, in one example, the fan structure is pivotally mounted to the first part, and when the first and second parts are closed together, the fan structure pivots relative to the first frame part to a stowed condition alongside the first part, and as the first and second frame parts are moved to the fully open condition, the fan structure may be pivoted relative to the first part by which it is mounted, to a position closer to the support surface that when in its stowed condition. When the first and second parts are opened to the fully open condition, a part of the fan structure remote from the pivotal mounting to the one side part, may engage with the second part of the frame, for example to extend between the feet where provided.
In a preferred embodiment though, to enable the first and second parts to be closed together, the fan structure may be dismountable from the remainder of the frame, and for example, stowed separately.

In each case the fan structure may include a mounting part which includes formations at opposite edges, for mounting, the fan structure with respect to the side parts, pivotally or dismountably.

The mounting part may include an opening in which the impeller is mounted for rotation. The impeller may force air downwardly to the support surface in use, or may draw air across the support surface. In each case, the impeller may conveniently rotate about an axis generally normal to the support surface. The impeller may be driven by a battery powered, and/or solar powered and/or mains powered electrical fan motor. The battery where provided may be rechargeable by the mains or a solar panel.

Preferably the fan structure includes a switch for switching the motor on or off. The switch may be manually operated, and/or automatically operated upon the side parts being closed, to switch off the fan motor.

In one embodiment, the first and second parts of the frame are connected for a general hinging movement between the open and closed conditions, the connection being towards the upper ends of the first and second parts.

If desired a retaining device may be provided to retain the first and second parts in the open condition, but in another example, this functionality may be achieved by the fan structure.

The first and second parts and a major proportion of the fan structure e.g. the mounting part thereof, may be each be made in a suitable mouldable plastic material such as for example polypropylene so that the frame is light and may
easily be moved from location to location by lifting the frame clear of the support surface with the first and second parts in a closed or open condition.

In a preferred arrangement, the first and second frame parts may each have generally planar major surfaces between the upper and the lower ends of the frame parts, and at least one of the major surfaces may be used for message conveying so that the frame is a sign. The fan structure may be mounted in use so that the impeller is closer to the support surface than to the upper ends of the first and second parts. The frame when the first and second side parts are opened, may, in side view, be generally triangular.

An embodiment of the invention will now be described with the aid of the accompanying drawings in which:-

FIGURE 1 is an exploded perspective view of a frame in accordance with the invention;

FIGURE 2 is side view of the frame of figure 1 shown in a closed condition.

Referring to the drawings, a frame 10 includes first 11 and second 12 parts, each part 11, 12 including a respective generally planar major surface 11a, 12a which may carry a message, sign or the like, and a respective generally planar minor surface 11b, 12b. Each part 11, 12 each has an upper end 11c, 12c and a lower end 11d, 12d, the frame being self-supportable, i.e. free standing, on a support surface 14 when the first and second parts 11, 12 are in the fully open condition shown in figure 1 when the lower ends 11d, 12d of the parts 11, 12 are moved fully apart. At the bottom corners of the lower ends 11d, 12d of the first and second parts 11, 12, the parts have feet 13a, 13b and 13c, 13d. When the frame 10 is supported on a support surface 14, the feet 13a-13d provide a four point support.
In another example feet 13a-13d may not be provided on both or either of the first and second frame parts 11, 12, and the frame 10 may be supported on the lower end or ends 11d, 12d of the first and second parts 11, 12.

The first and second parts 11, 12 are in this example made in a mouldable material namely polypropylene, but these could be made in other materials and other than by moulding but preferably the construction is light and may easily be lifted from the support surface 14. In the embodiment described, the parts 11, 12 are each moulded with integral connectors 15a, 15b of a connecting device 15, by means of which the parts 11, 12 are connected together for hinging movement.

In another embodiment, the connectors 15a, 15b may be separately made and fixed to the first and second parts 11, 12 to provide the functionality of the connecting device 15 described below.

The connecting device 15 includes for each part 11, 12, a headed axle 15a towards one side of the frame 10, and an opening 15b for the headed axle 15a of the other frame part, towards the other side of the frame 10, the respective headed axles 15a and openings 15b for the headed axles 15a being engaged to connect the first and second parts 11, 12 of the frame 10 together for a general hinging movement between the first fully closed condition shown in figure 2 and the fully open condition which can be envisaged from the exploded view of in figure 1.

It can be seen from figure 2 that the connecting device 15 is located towards the upper ends 11c, 12c of the first and second frame parts 11, 12, adjacent a handle formation H provide by an opening in each of the frame parts 11, 12, and by means of which the frame 10 can readily be carried e.g. by a janitor.
Alternative connecting devices 15 may be employed provided that the first and second frame parts 11, 12 are moveable between the fully open and fully closed conditions described, preferably in a generally hinging movement, e.g. about the axis of the headed axles 15a and openings 15b.

In accordance with the invention 10, the first and second parts 11, 12 at least when in the second fully open condition, mount a fan structure 20 which includes a sub assembly 22 of a rotatable impeller 22a and a motor 22. The impeller 22a in use is operative to move air over the support surface 14. The fan structure 20 further includes a mounting part 21 which mounts the sub-assembly 22, the mounting part 21 in this example being a generally rectangular part, which has a generally central opening 23 in which is provided the impeller 22a and motor 22b unit 22. The motor 22b drives the impeller 21 about an axis A which in use, is generally upright, and normal to the support surface 14. The motor 22b in this example is powered by a battery 24 which may be mains rechargeable, but in another example, the motor 22 may be driven by solar power, and/or the battery 24 may be rechargeable by solar power. Further alternatively the motor 22b could be mains powered but this may make connecting the frame 10 to the power supply over cumbersome.

The mounting part 21 of the fan structure 20 may if desired, be pivotally mounted to the first part 11 by means of hook formations provided at one edge 26 of the mounting part 21. The hook formations could hook over a rail provided on the first part 11, the rail extending between the opposite sides of the first part 11 generally parallel to the support surface 14. The mounting part 21 may in such an embodiment further include a further pair of engaging formations provided on an edge 30 of the mounting part 21 opposite to the edge 26 where the hook formations which engage the rail 28 of the first part 11 are provided. The engaging formations at edge 30, may be receivable on a rail formation of the second part 12 of the frame 10.
To move the frame parts 11, 12 of the frame 10 to the folded closed condition, the mounting part 21 would be raised at the un-pivoted edge 30 so that the engaging formations disengage the rail formation of second part 12, and the mounting part 21 may be pivoted up to a position alongside the inside of the first part 11, between the first and second parts 11, 12 of the frame 10. As necessary a shallow concavity may be provided between the first and second frame parts 11, 12 when folded to the closed condition, to accommodate the entire fan structure 20.

In the preferred example shown in the drawings, instead of folding the fan structure 20 inside the frame 10 to accommodate the fan structure 20 when the first and second frame parts 11, 12 are folded closed, the fan structure 20 is dismountable from the remainder of the frame 10.

On the edge 26 shown closest the first frame part 11, first hook formations 25 are provided, which engage in first receiving formations 28 of the first frame part 11, whilst on the opposite edge 30, second hook formations 29 are provided, which engage in second receiving formations 31 of the second frame part 12.

By disengaging the first and second hook formations 25, 29 from the respective receiving formations 28, 31, the fan structure 20 can be dismounted from the remainder of the frame, so that the fan structure 20 may be stowed separately from the first and second frame parts 11, 12.

It will be appreciated that with each an embodiment, when the frame 10 is in its fully open condition, the mounting part 21 will add rigidity to the structure, to enable the frame 10 to be lifted and moved from local location to location for example by a janitor, without disassembling the frame 10, or folding the frame 10. The frame 10 needs only to be folded closed, stowing the fan structure 20.
in-between the first and second parts 11, 12, or disassembling the fan structure 20 as in the embodiments described, for stowage.

If desired, an additional retaining device may be provided which co-operates between the first and second frame parts 11, 12 to assist in maintaining the first an second frame parts 11, 12 in their fully open condition, during use.

It will be appreciated that in the example described with reference to figure 2, where the battery 24 is provided and this is mains rechargeable, this may be done by plugging-in a mains lead, whilst the fan structure 20 is mounted to or disassembled from the first and second frame parts 11, 12.

Other features of the embodiment shown in the drawings include the provision of a battery cover 33 to cover a battery compartment of mounting part 21, in which the battery 24 is accommodated, and a microswitch 34 which includes a plunger 35 which, as the first and second frame parts 11, 12 are closed together, opens as the plunger 35 is moved inwardly of the switch, to break the power circuit to the motor 22. Thus the impeller 21 is in this example driven whenever the first and second frame parts 11, 12 are opened to their fully open condition.

A manually operable switch 36 is provided as well as the microswitch 34, in this example.

Various modifications may be made without departing from the scope of the invention in addition to those already suggested above. For example the configurations of the first and second frame parts 11, 12 may be very different to the configurations described, but the invention has been developed particularly for an “A” frame in which the lower ends 11a, 12a are moved apart whilst the parts 11, 12 are connected towards their upper ends, to erect the frame 10, so that in side view, the frame 10 presents a triangle.
The frame parts 11, 12 may be made in alternative materials to that described, and the connecting device 15 need not be integrally formed (moulded) as described. The mounting part 21 of the fan structure 20 may be moulded too, or may be made of an alternative material and may be fabricated as desired.

In the example illustrated, the frame 10 has a handle H provided by an opening in each of the first and second frame parts 11, 12 in the region of the connecting device 15. Positioning the handle H here enables a user to erect the frame 10 by grasping the frame parts 11, 12 towards the upper ends 11c, 12c of the parts 11, 12 above the connecting devices 15, and squeezing together to bring the minor surface frame parts 11b, 12b together. The first and second parts 11, 12 are formed at their upper ends 11c, 12c above where the connecting device 15 is provided, with straight edged recessed regions R1, R2 which extend at angles to the general extent of the respective first and second parts 11, 12 to permit the upper ends 11c, 12c to move towards one another as the frame 10 is opened, which recessed regions R1, R2 engage when the frame 10 is fully open end, to prevent further opening.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.
CLAIMS

1. A free standing frame which includes first and second parts each having an in use, upper end and a lower end, the first and second parts being connected together to permit the parts to be moved from a first, fully closed condition in which the lower ends of the first and second parts are close together and a second fully open condition in which the lower ends of the first and second parts are spaced apart to enable the frame to be supported on a support surface, and wherein the first and second parts, at least when in the second fully open condition, mount a fan structure which includes a rotatable impeller which in use is operative to move air over the support surface.

2. A frame according to claim 1 which is supportable on the support surface by feet provided by the first and second parts, which provide a four point support.

3. A frame according to claim 1 or claim 2 wherein when the first and second parts are closed together, the fan structure is stowed between the first and second parts.

4. A frame according to claim 3 wherein the fan structure is foldable relative to the first part to a stowed position.

5. A frame according to claim 4 wherein the fan structure is pivotally mounted to the first part, and when the first and second parts are closed together, the fan structure pivots relative to the first part to a stowed condition alongside the first part, and as the first and second frame parts are moved to the fully open condition, the fan structure is pivoted relative to the first part by which it is mounted, to a position closer to the support surface that when in its stowed condition.
6. A frame according to claim 5 wherein when the first and second parts are opened to the fully open condition, a part of the fan structure remote from the pivotal mounting to the first frame part, engages with the second part of the frame, for example to extend between the feet where provided.

7. A frame according to claim 1 or claim 2 wherein the fan structure is dismountable from the remainder of the frame to permit the first and second frame parts to be folded together.

8. A frame according to any one of the preceding claims wherein the fan structure includes a mounting part which includes formations at opposite edges, for mounting, the fan structure with respect to the frame side parts.

9. A frame according to claim 8 wherein the mounting part includes an opening in which the impeller is mounted for rotation.

10. A frame according to claim 9 wherein the impeller rotates about an axis generally normal to the support surface.

11. A frame according to claim 9 or claim 10 wherein the impeller is driven by a battery powered, and/or solar powered and/or mains powered electrical fan motor.

12. A frame according to claim 11 wherein the battery where provided, is rechargeable by the mains or a solar panel.

13. A frame according to any one of the preceding claims wherein the fan structure includes a switch for switching the motor on or off.
14. A frame according to claim 13 wherein the switch is one of manually operated and/or automatically operated upon the side parts being closed, to switch off the fan motor.

5 15. A frame according to any one of the preceding claims wherein the first and second parts of the frame are connected for a general hinging movement between the open and closed conditions, the connection being towards the upper ends of the first and second parts.

10 16. A frame according to any one of the preceding claims wherein the first and second frame parts each have generally planar major surfaces between the upper and the lower ends of the parts, at least one of the major surfaces conveying a message so that the frame is a sign.

15 17. A frame according to any one of the preceding claims wherein the fan structure is mounted in use so that the impeller is closer to the support surface than to the upper ends of the first and second parts.

18. A frame according to any one of the preceding claims wherein the frame, when the first and second side parts are opened, in side view, is generally triangular.

19. A free standing frame substantially as hereinbefore described with reference to and/or as shown in the accompanying drawings.

20 12. Any novel feature or novel combination of features described herein and/or as shown in the accompanying drawings.
Application No: GB0805516.2
Claims searched: 1-19

Examiner: Mr Mark Sexton
Date of search: 4 July 2008

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

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<td>X</td>
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<td>US 2003/115783 A1 (WOOSLEY) - see whole document, noting paragraphs 16 and 18 in particular</td>
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Field of Search:

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

F26B; G09F

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

Online:WPI, EPODOC

International Classification:

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