

A garment steamer with docking assembly

5 FIELD OF THE INVENTION

The present invention relates to a garment steamer.

BACKGROUND OF THE INVENTION

Garment steamers are used to remove creases from fabric, such as clothing and
10 bedding, using steam. Stand garment steamers comprise a steamer head which is supplied
steam from a stand base unit housing a steam generator and a water reservoir. The stand
generally includes a hook or hanger on an upstanding support over which a garment or other
fabric is hung to be treated with steam.

A user orientates the steamer head relative to the fabric to be treated by
15 holding the steamer head which is connected to the stand by a hose. During use, steam is
expelled from the steamer head and is directed towards the fabric to be treated, which hangs
from the support.

Stretching of a fabric whilst performing the steaming operation is known to
improve the de-wrinkling effect of applying steam to a fabric. It is for example known to
20 have a stand garment steamer with a treatment board which sucks the fabric being treated
onto the board, while user can stretch the fabric across the surface of the treatment board.

It is well known to provide a steamer head holder on a garment steamer for
storing or temporarily resting a steamer head when it is not being used, for example when
clothes are being positioned on the steamer. In some known garment steamers, a holder
25 protruding from the rear side of a support pole is provided to support steamer head.

One disadvantage of such a garment steamer is that by having to place the
steamer head on the rear side of the garment steamer, the position of the steamer head
becomes obscured and makes it difficult for the user to retrieve the steamer head. In addition,
temporary resting of the steamer head may cause steam vents to direct steam towards the user
30 which can cause discomfort or injury.

A holder may instead be provided on the front side. However, the position of
the holder on the front causes a steam hose connected to the steamer head to obstruct a user
when they try to hang and/or position garments on the steamer.

It is also known to provide a docking assembly having a support arm which has a holder on one end and a support pole connector on the other. The holder has an orientation such that the holder is proximate to the user and steam is not discharged towards them. Therefore, when the holder is positioned to the right of the support pole, for example, it is difficult to dock and remove for a left handed user, and vice versa.

CN205603917U discloses a docking assembly for the steamer head comprising an arm attachable to support pole of the garment steamer and a holder connected to the arm. The docking assembly can be mounted on either side of a support pole and have the holder attached to the arm in an orientation such that the steamer head faces away from the user and does not eject steam towards the user. The docking assembly can thus be used by both left and right handed users and positioned so that the steamer head is easily accessible to either type of user whilst minimizing the risk of being burnt by steam.

However, configuring the docking assembly is time consuming, requiring attachment and detachment operations.

EP 3 581 700 discloses an apparatus for steam-treatment of laundry including a base connected by a conduit to an ironing (and/or smoothing) tool, e.g. an iron. The apparatus has telescopic support poles which support an ironing board, and one of them supports a cross arm at the extremity of which is a support device on which the iron can be placed.

There is therefore a need for a garment steamer with a docking assembly which substantially alleviates or overcomes one or more of the problems mentioned above.

SUMMARY OF THE INVENTION

The invention is defined by the claims.

According to examples in accordance with an aspect of the invention, there is provided a garment steamer for treating a garment, comprising:

- a base;
- a steamer head connected to the base via a hose;
- a pole assembly connected to the base and extending upwards;
- a docking assembly for docking the steamer head, the docking assembly comprising:
 - a support arm having a first extremity and a second extremity, the second extremity being mounted to the pole assembly;
 - a steamer head holder for releasably supporting the steamer head; and

- a first pivoting coupling arranged between the first extremity and the steamer head holder, the first pivoting coupling defining a first rotation axis extending substantially vertically.

Note that any reference to vertical or horizontal parts relate to orientations which arise when the garment steamer is in use on a horizontal base surface (i.e. a floor of a room).

The first pivoting coupling may be used to enable rotary adjustment of the steamer head holder without any tool, as it just involves rotation of the steamer head holder. The steamer head holder can be rotated to a desired position so that the steamer head faces away from the user. Thus, the invention provides a support for the steamer head which can be configured easily and quickly to support different users' preferences.

The first pivoting coupling for example allows the steamer head to be rotated between a position in which it generally faces a front side of the steamer stand and a position in which it generally faces an opposite side of the steamer stand. The first pivoting coupling may allow full rotation or it may be limited for example between two opposite directions (180 degrees apart).

The steamer head holder for example comprises a cradle, the cradle having an end face for covering a steam exit face of a steamer head. The support arm for example extends horizontally in normal use.

The pole assembly preferably comprises (at least) a first vertical pole at one side of the garment steamer and a second vertical pole at an opposite side of the garment steamer. The second extremity of the support arm is then detachably mountable to the first or second vertical poles.

The support arm can thus be mounted on either side of the garment steamer (on a selected one of the vertical poles), to support left and right handed operation. This can also be achieved with no tools. The support arm can be simply hooked or clipped or slid onto a receiving bracket on the vertical poles.

The first and second vertical poles for example each comprise a slot arrangement for detachably receiving the second extremity of the support arm. The support arm for the steamer head can be mounted easily and quickly to one of the vertical poles to support different users' preferences.

The first pivoting coupling is for example adapted to:

- allow 360 degree rotation of the steamer head holder relative to the support arm; or

- allow rotation of the steamer head holder relative to the support arm in a 180 degree angle range.

A 180 degree range for example enables the steamer head holder to be rotated between forward and backward directions.

5 The first pivoting coupling may comprise a rotary indexing mechanism adapted to enable the steamer head holder to rotate between pre-defined angular positions for example at intervals of 90 degrees. This makes it easy to find the suitable rotational position.

 The rotary indexing arrangement for example comprises a resilient projection arrangement and a recess arrangement, each disposed on or around an arc around an axis of
10 rotation between the steamer head holder and the support arm. There may be a single projection and a set of a plurality of recesses or a single recess and a set of a plurality of projections. The rotary indexing arrangement may instead comprise a resilient recess arrangement and a projection arrangement.

 The resilient projection arrangement for example comprises:

- 15
 - a projection member arranged on an elastically deformable portion of the support arm; or
 - a projection member arranged on a spring (or a separate elastically deformable member) that is mounted on the support arm.

 The steamer head holder is for example detachably mounted to the support
20 arm. The steamer head holder is for example fitted to the arm using a clip mechanism.

 The garment steamer preferably further comprising a treatment board mounted to the pole assembly.

 The treatment board is for example pivotable relative to the pole assembly between a first orientation which is substantially vertical in normal use, and a second
25 orientation which is substantially horizontal in normal use. This enables the user to use the treatment board for steaming hanging clothes or for pressing clothes on a horizontal surface. Substantially horizontal/vertical is intended to mean within 10 degrees of horizontal/vertical for example.

 A second pivoting coupling is for example arranged between the pole
30 assembly and the second extremity of the support arm, wherein the second pivoting coupling defines a second rotation axis extending vertically (in normal use).

 The second pivoting coupling allows the support arm to be rotated, for example between an extended position and a retracted position. In this way, the steamer head may be moved to a different position for the different configurations of the treatment board.

The second pivoting coupling may comprise a limit mechanism to limit the rotation angle of the support arm relative to the pole assembly to a 90 degree range. By limiting rotation of the arm to 90 degrees, the steamer head holder and the steamer head may be rotated between an extended position and a retracted position under the treatment board in one direction only. For example, it may be rotated towards the rear face of the vertical treatment board. This may be preferable because rotating to a position in front of the treatment board may obstruct the adjustment of the treatment board between its different configurations.

The retracted position allows the support arm to be under the treatment board during horizontal steaming so that the user has more space to move around the treatment area.

The limit mechanism may comprise an arcuate recess defining an angle of 90 degrees, and a projection adapted to cooperate with the arcuate recess.

The steam generator is for example in the base and the hose is a steam hose. However, the alternative of a steam generator in the handle is also possible.

These and other aspects of the invention will be apparent from and elucidated with reference to the embodiment(s) described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the invention, and to show more clearly how it may be carried into effect, reference will now be made, by way of example only, to the accompanying drawings, in which:

Figure 1 shows a first view of a known stand garment steamer;

Figure 2 shows a second view of the known stand garment steamer of Figure 1;

Figure 3 shows an example of a garment steamer in accordance with the invention;

Figure 4 shows one of the vertical poles, with a mounting bracket in the form of a slot;

Figure 5 shows three relative rotational positions of the steamer head holder relative to the support arm;

Figure 6 shows the garment steamer configured for right hand use;

Figure 7 shows the garment steamer configured for left hand use;

Figure 8 shows the garment steamer with the treatment board in the horizontal position;

Figure 9 shows the coupling between the steamer head holder and the support arm to implement a rotary indexing mechanism;

5 Figure 10 shows the rotary indexing mechanism in close up;

Figure 11 shows the design of the support arm in more detail;

Figure 12A shows a first example of the second pivoting coupling between the support arm and the pole assembly;

10 Figure 12B-12C show a second example of the second pivoting coupling between the support arm and the pole assembly;

Figure 13 shows the underside of the docking assembly with the support arm coupled to the vertical pole;

Figure 14 shows the garment steamer with the steamer head holder rotated to be underneath the treatment board; and

15 Figure 15 shows a locking bar for locking the treatment board in the horizontal position.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The invention will be described with reference to the Figures.

20 It should be understood that the detailed description and specific examples, while indicating exemplary embodiments of the apparatus, systems and methods, are intended for purposes of illustration only and are not intended to limit the scope of the invention. These and other features, aspects, and advantages of the apparatus, systems and methods of the present invention will become better understood from the following
25 description, appended claims, and accompanying drawings. It should be understood that the Figures are merely schematic and are not drawn to scale. It should also be understood that the same reference numerals are used throughout the Figures to indicate the same or similar parts.

The invention provides a garment steamer with a base, a steamer head
30 connected to the base via a hose and a pole assembly connected to the base and extending upwards. A docking assembly is provided for docking the steamer head, with a support arm and a steamer head holder for releasably supporting the steamer head. A first pivoting coupling is provided between the support arm and the steamer head holder to enable rotary adjustment of the steamer head holder orientation, without any tool. The steamer head holder

can be rotated to a desired position so that the steamer head faces in a desired direction, for example away from the user.

Figure 1 and Figure 2 show a known stand garment steamer 1. The stand garment steamer 1 generates steam which is used to heat and moisten a fabric (not shown) to aid the removal of creases from the fabric. Fabrics to be treated include, but are not limited to, clothing. The fabric to be treated is supported by the stand garment steamer 1 during treatment.

The stand garment steamer 1 comprises a base unit 2, a treatment board 14, and first and second vertical poles 19 which together form a pole assembly. The vertical poles 19 support the treatment board 14 and extend between the base unit 2 and the treatment board 14.

The base unit 2 has a water reservoir (not shown) and a steam generator (not shown) in particular a boiler. The base unit 2 has a housing 2a, and the water reservoir and steam generator are in the housing 2a. The water reservoir stores water which is fed into the steam generator to be converted to steam. It will be understood that the water reservoir and the steam generator may be integral.

Note that in an alternative design, the steam generator may be in the hand-held steamer head, and the base unit then supplies water to the steamer head. They may even be two steam generators; one in the base and one in the steamer head.

The base unit 2 defines a base 3 of the stand garment steamer 1. The base 3 defines a planar surface which is positionable against a floor, for example, to support the stand garment steamer 1. It will be understood that the base 3 may be formed from two or more planar surfaces extending on a plane, for example the lower faces of four feet (not shown). The plane of the base 3 typically defines a horizontal plane in use.

One end of a hose 11 extends from the base unit 2. In the example shown, the hose 11 is a steamer hose, and it fluidly communicates with the steam generator such that steam generated by the steam generator flows along the steamer hose 11. A steamer head 5 is disposed at the other end of the steamer hose 11. The steamer head 5 fluidly communicates with the base unit 2 via the flexible steamer hose 11. Therefore, steam from the steam generator is supplied to the steamer head 5.

The steamer head 5 has a handle portion 7 and a steamer plate 8. The handle portion 7 is configured to allow a user to hold the steamer head 5. The steamer plate 8 acts as a steamer face. The steamer plate 8 is configured to be positioned against the fabric to be

treated. The handle portion 7 and the steamer plate 8 are at opposing ends of the steamer head 5.

The steamer head 5 is shown resting on a bracket which is mounted to one of the vertical poles 19. For example, if the bracket is mounted to the left vertical pole 19, as illustrated in Figure 1, the bracket holds the steamer head such that the steamer plate 8 faces away from the user.

The steamer head 5 has a steam outlet 10 shown in Figure 2. The steam outlet 10 is formed by one or more steam openings through which steam is expelled from the steamer head 5 during use. The steam outlet 10 fluidly communicates with the steamer hose 11. Therefore, steam provided to the steamer head 5 is expelled from the steamer head 5 through the steam outlet 10.

The treatment board 14 is pivotable about the pole assembly 19. Thus, the orientation of the treatment board 14 is movable relative to the plane of the base 3. The treatment board 14 is shown in Figs. 1 and 2 in a vertical orientation. The treatment board 14 acts as a garment support for receiving a fabric and positioning the fabric in a manner that enhances the removal of creases.

The treatment board 14 is generally rectangular and has treatment surface 17. The treatment surface 17 is generally planar. However, it will be understood that alternative configurations are possible.

The treatment board 14 is configured to be rigid in order to withstand the forces applied on the treatment board 14 by the user during steaming, so that bending of the treatment surface 17 is reduced and the fabric remains in place and stretched correctly. The treatment board 14 comprises a hanging element 16 at one end. The hanging element 16 may be, for example, but not limited to, a hook or a hanger. Vents 18 are formed in the treatment surface 17.

Figure 3 shows an example of a garment steamer in accordance with the invention. The steamer head 5 is omitted in Figure 3.

The garment steamer has generally the same design as the design of Figure 1, in that it comprises a base 2 and a pole assembly comprising two vertical poles 19 connected to the base and extending upwards to a treatment board 14.

The design of Figure 3 has a docking assembly 30 for docking the steamer head. The docking assembly comprises a support arm 32 having a first extremity 34 and a

second extremity 36. The second extremity 36 is mounted to the pole assembly, in particular to a selected one of the vertical poles 19.

A steamer head holder 38 is mounted at the first extremity 34 for releasably supporting the steamer head.

5 A first pivoting coupling 40 is arranged between the first extremity 34 and the steamer head holder 38, with a first rotation axis extending vertically (in normal use).

The steamer head holder 38 forms a cradle having an end face 42 for covering the steamer plate and steam outlet of the steamer head. The support arm 32 extends horizontally (in normal use) so that when the steamer head rotates about the first pivot axis, it
10 does so in a horizontal plane.

The pole assembly comprises a first vertical pole at one side of the garment steamer and a second vertical pole at an opposite side of the garment steamer.

Figure 4 shows one of the vertical poles, with a mounting bracket in the form
15 of a slot 50 to enable the second extremity 36 of the support arm 32 to be detachably mountable to the vertical pole. In particular, the second extremity 36 of the support arm in this example has a hook 52 (shown in Figure 5) for hooking over the slot 50.

There is a slot 50 at each end of a slider bar 54. The slider bar is used as a pivot for a brace (or arm). The slider bar can slide up and down the pole assembly to allow
20 the treatment board to be pivoted between a vertical orientation and a horizontal orientation. The vertical pole 19 has 3 sections. The part that has the slot 50 is fixed to the top of the middle section of the vertical pole 19. The treatment board is pivoted between vertical and horizontal orientation by retracting/extending the top section of vertical pole 19 into the middle section.

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Figure 5 shows three relative rotational positions of the steamer head holder 38 relative to the support arm 32, by means of the first pivoting coupling. Assuming the support arm extends laterally outwardly (i.e. sideways) from the pole assembly, the top image shows the steamer head holder directed to one of the front or back of the steamer, the middle
30 image shows the steamer head holder directed to the other of the front or back, and the bottom image shows the steamer head holder facing laterally inwardly. The top image shows the rotation axis 39.

The first pivoting coupling may be used to enable rotary adjustment of the steamer head holder without any tool, as it just involves rotation of the steamer head holder.

The steamer head holder can be rotated to a desired position so that the steamer head faces a desired direction, e.g. away from the user. Thus, the invention provides a support for the steamer head which can be configured easily and quickly to support the user's preference.

5 The first pivoting coupling thereby allows the steamer head held in the steamer head holder to be rotated between a position in which it generally faces a front side of the steamer stand and a position in which it generally faces an opposite side of the steamer stand. The pivoting coupling may allow full rotation or it may be limited for example between the two opposite directions shown in the top two images of Figure 5 (180 degrees apart).

10 The support arm can thus be mounted on either side of the garment steamer (on a selected one of the vertical poles 19), to support left and right handed operation. This can also be achieved with no tools. The support arm can be simply hooked or clipped or slid onto a receiving bracket on the chosen vertical pole. It can then be rotated to face in the desired direction, typically facing away from the user, so that the user can hold the steamer
15 head with the steamer plate (the steam outlet) facing away from them.

Figure 6 shows the garment steamer configured for right hand use. The user faces the treatment surface of the treatment board. The docking assembly 30 is on the right hand vertical pole and the steamer head holder 38 faces away from the user.

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Figure 7 shows the garment steamer configured for left hand use. The user faces the treatment surface of the treatment board. The docking assembly is on the left hand vertical pole and the steamer head holder 38 faces away from the user.

25 There is a relative rotation of 180 degrees at the first pivot coupling between the configurations of Figures 6 and 7.

Figure 8 shows the garment steamer with the treatment board 14 in the horizontal position. The docking assembly is just beneath the level of the treatment board, and the steamer head holder faces inwardly.

30 The steamer head holder 38 may be freely rotatable about the support arm, or it may be rotatable within a fixed range of movement.

In addition, the first pivoting coupling 40 may comprise a rotary indexing mechanism. This enables the steamer head holder to rotate between pre-defined angular positions. This makes it easy to find the suitable rotational position.

For example, the steamer head holder may be indexed to the two end positions shown in the top two images of Figure 5. It may also be indexed to the intermediate position shown in the bottom image of Figure 5.

5 Figure 9 shows the coupling between the steamer head holder 38 and the support arm 32 to implement a rotary indexing mechanism. There is a resilient projection arrangement and a recess arrangement, each disposed on or around an arc around an axis of rotation between the steamer head holder and the support arm.

 The example of Figure 9 shows a single resilient projection 90 provided at the
10 support arm and a set of a plurality of recesses 92 provided at the steamer head holder 38. The steamer head holder is fixed to the support arm by a screw 94 which extends along the axis of rotation between them.

 The resilient projection is in this example formed on an elastically deformable portion of the support arm. It is thus integrally formed with the support arm, and in this
15 example it is pushed downwardly by the steamer head holder, but returns upwardly when the projection is aligned with a recess 92. There are three recesses 92 shown, one for each of the rotational positions of Figure 5.

 An alternative is to provide a separate projection member and a spring between the projection member and the support arm to bias the projection member.

20 Figure 9 shows the steamer head holder connected to the support arm using a screw. It may be fitted by a clip mechanism so that it can be removed without tools.

Figure 10 shows the rotary indexing mechanism in close up.

25 Figure 11 shows the design of the support arm 32 in more detail as well as the resilient projection. It can be seen how the second extremity 36 comprises a hook 52 for hooking over the slot 50 of the bracket on the vertical pole.

 The example of Figures 3 to 11 makes use of a support arm which extends laterally outwardly in a fixed direction from the vertical pole to which it is connected.

30 An alternative design provides a second pivoting coupling between the pole assembly and the second extremity 36 of the support arm 32. This second pivoting coupling defines a second rotation axis 111 which also extends vertically in normal use.

Figure 12A shows a first example of the second pivoting coupling 110.

The support arm 32 has a vertically projecting boss 120 at the second extremity which is received in a cylindrical slot 122 of the mounting bracket on the vertical pole 19.

The second pivoting coupling 110 allows the support arm 32 to be rotated, for example between an extended position (as shown in the examples above, with the support arm extending laterally outwardly) and a retracted position. The retracted position is shown in Figure 12 (but with the support arm and mounting bracket disconnected). It means the steamer head holder 38 can be rotated underneath the treatment board 14, when it is in the horizontal orientation.

The support arm is then parallel to the side of the treatment board. This requires only a 90 degree range of movement of the support arm relative to the vertical pole. In particular, it is only desired to rotate the support arm towards the back of the treatment board, since in this location it will not prevent the adjustment of the board from vertical to horizontal and vice versa. For this purpose, a pin and recess arrangement is used to function as a limit mechanism, as illustrated in Figure 12A.

In this way, the steamer head may be moved to a different positions for the different configurations of the treatment board. Other limit mechanisms may of course be used.

Figure 12B-12C show a second example (underside view) of the second pivoting coupling 120 between the support arm and the pole assembly. Figure 12B is an exploded view, while Figure 12C is the view after assembly.

Compared to the example of Figure 12A, the radial protrusion 124 of Figure 12A is replaced by a radial protrusion 124B arranged on the periphery of the boss 120. This functions as a guide pin. The radial protrusion 124B cooperates with the arcuate recess 126 of the cylindrical slot. The radial protrusion 124B can only slide in the arcuate recess over the desired angular range.

Figure 13 shows the underside of the docking assembly with the support arm coupled to the vertical pole.

Figure 14 shows the garment steamer with the steamer head holder 38 rotated to be underneath the treatment board 14.

This gives the user more space around the treatment board when using it in the horizontal position. It also means the steamer head holder is not in the way if the steaming function is not being used, for example if it is being used as an ironing board.

5 The rotation of the steamer head holder, to retract the steamer head holder, is only of interest when operating in the horizontal configuration. When the steamer head is under the treatment board, it could be inconvenient for the user when the user folds back the garment steamer to the vertical position.

10 As shown in Figure 15, the garment steamer comprises a locking bar 150, which is operated to lock the treatment board in the vertical position and in the horizontal position. Also, the locking bar 150 may prevent rotation of the support arm when it is not in the locked position incidentally.

Figure 15 also shows the steamer head 7 in the steamer head holder 38.

15 Variations to the disclosed embodiments can be understood and effected by those skilled in the art in practicing the claimed invention, from a study of the drawings, the disclosure and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality.

The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage.

20 If the term "adapted to" is used in the claims or description, it is noted the term "adapted to" is intended to be equivalent to the term "configured to".

Any reference signs in the claims should not be construed as limiting the scope.