

CLOTHES DRYING RACK

Field of the Invention

[1] The present invention relates to a clothes drying rack, and in particular to a clothes drying rack for high-rise apartments.

[2] The invention has been developed primarily for use in/with high-rise apartments and will be described hereinafter with reference to this application. However, it will be appreciated that the invention is not limited to this particular field of use.

Background of the Invention

[3] At present, in areas with high density residential living such as in apartment blocks, the drying of clothes may be problematic. In areas such as Singapore, many apartments are built with tubular holding formations on an outer wall of the apartment and underneath beneath the apartment windows. Laundry is typically spaced out on hanging poles. The hanging poles are then extended out of the window and mounted into the tubular holding formations by hand. However, especially for weaker people, leaning out of an apartment window carrying a laden hanging pole can be dangerous. There have been reports of people falling out of windows while performing this task.

[4] The present invention seeks to provide a clothes drying rack, which will overcome or substantially ameliorate at least some of the deficiencies of the prior art, or to at least provide an alternative.

[5] It is to be understood that, if any prior art information is referred to herein, such reference does not constitute an admission that the information forms part of the common general knowledge in the art, in Australia or any other country.

Summary of the Invention

[6] According to a first aspect, the present invention may be said to consist in a clothes drying rack for hanging clothes from a construction including a window and an outer wall extending below the window, the clothes drying rack comprising:

- a. a mounting arrangement configured for securely mounting the clothes drying rack to a fixed structure in use,
- b. a supporting arrangement, the supporting arrangement being configured for supporting an elongate horizontal sliding member in a horizontally sliding fashion;

- c. a clothes hanging arrangement for hanging clothes on, the clothes hanging arrangement including an elongate horizontal sliding member, the elongate horizontal sliding member being configured for being supported by the supporting arrangement in a sliding fashion.

[7] In one embodiment, the mounting arrangement is configured for securely mounting the clothes drying rack to an outer wall of the construction.

[8] In one embodiment, the mounting arrangement is configured for securely mounting the clothes drying rack to a ceiling inside the construction.

[9] In one embodiment, the supporting arrangement is a supporting frame.

[10] In one embodiment, the mounting arrangement is a wall mount.

[11] In one embodiment, the clothes hanging arrangement includes at least one or more clotheslines.

[12] In one embodiment, the mounting arrangement is configured for mounting to at least one or more tubular formations extending from the outer wall.

[13] In one embodiment, the mounting arrangement includes a locking or securing mechanism for locking the mounting arrangement to the at least one or more tubular formations.

[14] In one embodiment, the locking mechanism includes a threaded screw that is screwable or movable to securely engage with the at least one or more tubular formations.

[15] In one embodiment, the locking mechanism includes one or more U-bolts for engaging around one or more of the one or more tubular formations.

[16] In one embodiment, the mounting arrangement is configured for being bolted onto the outer wall.

[17] In one embodiment, the supporting frame includes one or more selected from an aperture and a recess for receiving the elongate horizontal sliding member.

[18] In one embodiment, the supporting frame includes a horizontal support arrangement configured for supporting the elongate horizontal sliding member.

[19] In one embodiment, the horizontal support arrangement includes a horizontal support member for supporting the elongate horizontal sliding member in a sliding fashion.

[20] In one embodiment, the horizontal support arrangement includes one or more selected from a recess and an aperture into which the elongate horizontal sliding member is receivable.

[21] In one embodiment, the horizontal support arrangement includes at least one or more rollers for facilitating the sliding movement of the elongate horizontal sliding member.

[22] In one embodiment, the horizontal support arrangement is a supporting frame.

[23] In one embodiment, the rollers are bearings.

[24] In one embodiment, the supporting frame includes one or more bushings for facilitating the sliding movement of the elongate horizontal sliding member.

[25] In one embodiment, the bushings include low friction sliding surfaces for facilitating the sliding movement of the elongate horizontal sliding member.

[26] In one embodiment, the supporting frame includes a vertical adjustment mechanism for moving the height of at least part of the supporting frame in use.

[27] In one embodiment, the supporting arrangement includes a vertical support arrangement configured for supporting the clothes hanging arrangement to move between an upper position and a lower position.

[28] In one embodiment, the clothes drying rack includes a vertical adjustment mechanism configured for moving the height of at least part of the clothes hanging arrangement between an upper position and a lower position in use.

[29] In one embodiment, the clothes drying rack includes a horizontal adjustment mechanism configured for moving the clothes hanging arrangement between a retracted position and an extended position in use.

[30] In one embodiment, the supporting frame is configured for holding at least part of the horizontal support member in alignment with the window in use.

[31] In one embodiment, the vertical adjustment mechanism includes a collapsible frame.

[32] In one embodiment, the collapsible frame is configured to move between an upper position and a lower position.

[33] In one embodiment, the collapsible frame is configured to support the horizontal support arrangement in a position in which the horizontal elongate sliding member is held in substantially horizontal alignment as it moves between its upper position and lower position.

[34] In one embodiment, the collapsible frame is configured to hold the horizontal support member in a substantially horizontal alignment as it moves between its upper position and lower position.

[35] In one embodiment, the collapsible frame includes an inner mounting formation and an outer mounting formation, the inner mounting formation and the outer mounting formation being pivotably connected by at least a pair of pivoting struts.

[36] In one embodiment, the inner mounting formation is configured for mounting to the outer wall.

[37] In one embodiment, the outer mounting formation is configured for mounting to the horizontal support member.

[38] In one embodiment, the collapsible frame includes at least two pairs of pivoting struts.

[39] In one embodiment, the inner mounting formation includes the mounting arrangement.

[40] In one embodiment, the vertical adjustment mechanism includes a damping arrangement.

[41] In one embodiment, the damping arrangement includes a piston and cylinder arrangement.

[42] In one embodiment, the vertical adjustment mechanism includes a latch arrangement.

[43] In one embodiment, the vertical adjustment mechanism includes a telescoping arrangement.

[44] In one embodiment, the telescoping arrangement includes a plurality of telescoping members.

[45] In one embodiment, the supporting frame includes a height adjustable elongate member.

[46] In one embodiment, the vertical adjustment mechanism includes a vertical support arrangement.

[47] In one embodiment, the vertical support arrangement is configured for supporting the height adjustable elongate member in a vertical orientation.

[48] In one embodiment, the vertical support arrangement includes one or more selected from an aperture and a recess for receiving the height adjustable elongate member extending in a substantially vertical direction.

[49] In one embodiment, the vertical support arrangement includes a vertical support frame configured for receiving a height adjustable elongate member.

- [50] In one embodiment, the vertical support frame includes a plurality of frame members.
- [51] In one embodiment, the vertical support frame includes at least one or more threaded shafts configured for engagement with complementary threaded nuts.
- [52] In one embodiment, the vertical support frame includes one or more selected from bearings and rollers for facilitating movement of the height adjustable elongate member.
- [53] In one embodiment, the one or more selected from bearings and rollers are configured for engagement with a plurality of opposed surfaces of the height adjustable elongate member.
- [54] In one embodiment, the vertical support frame includes a tightening mechanism configured for tightening the vertical support frame against the height adjustable elongate member to ensure firm engagement of the one or more selected from bearings and rollers.
- [55] In one embodiment, the tightening mechanism includes at least one or more threaded shaft configured for engagement with complementary threaded nuts.
- [56] In one embodiment, the vertical adjustment mechanism includes a vertical support member.
- [57] In one embodiment, the vertical support member includes one or more selected from an aperture and a recess for receiving the height adjustable elongate member extending in a substantially vertical direction.
- [58] In one embodiment, the vertical adjustment mechanism includes a locking arrangement for locking the height adjustable elongate member in place.
- [59] In one embodiment, the locking arrangement includes a locking pin receivable within aligned apertures in the height adjustable elongate member and the vertical support member.
- [60] In one embodiment, the vertical adjustment mechanism includes a gear cog:
- [61] In one embodiment, the vertical adjustment mechanism includes a chain arrangement.
- [62] In one embodiment, the vertical adjustment mechanism includes a moving mechanism for moving the clothes hanging arrangement between an upper position and a lower position.
- [63] In one embodiment, the moving mechanism includes a threaded shaft.
- [64] In one embodiment, the moving mechanism includes an internally threaded bushing for threaded engagement with the threaded shaft.

[65] In one embodiment, the moving mechanism includes mounting formations for mounting the threaded shaft to the mounting arrangement in a rotating manner.

[66] In one embodiment, the internally threaded bushing is securely coupled to the height adjustable elongate member.

[67] In one embodiment, the moving mechanism includes a worm gear engageable with a gear cog.

[68] In one embodiment, the gear cog is configured to drive a rack and pinion mechanism.

[69] In one embodiment, the moving mechanism includes a handle.

[70] In one embodiment, the moving mechanism includes a winch.

[71] In one embodiment, the winch is a brake winch.

[72] In one embodiment, the winch is mounted to the mounting arrangement.

[73] In one embodiment, the winch includes a winch drum and a cable.

[74] In one embodiment, the cable is coupled to the height adjustable elongate member.

[75] In one embodiment, the cable is coupled to a lower portion of the height adjustable elongate member.

[76] In one embodiment, the winch drum is mounted above the lower portion of the height adjustable elongate member.

[77] In one embodiment, the vertical adjustment mechanism includes a latching arrangement.

[78] In one embodiment, the clothes hanging arrangement includes a plurality of transverse struts extending from the elongate horizontal sliding member.

[79] In one embodiment, the clothes hanging arrangement includes a plurality of clotheslines.

[80] In one embodiment, the clotheslines extend parallel to the elongate horizontal sliding member.

[81] In one embodiment, the moving mechanism includes a prime mover.

[82] In one embodiment, the prime mover is configured for driving the vertical adjustment mechanism to move the clothes hanging arrangement between an upper position and a lower position.

[83] In one embodiment, the prime mover includes at least one or more motors.

[84] In one embodiment, the prime mover is an electric motor.

[85] In one embodiment, the moving mechanism is configured for connection to an electrical power source.

[86] In one embodiment, the moving mechanism includes a power source.

[87] In one embodiment, the power source is a battery.

[88] In one embodiment, the moving mechanism includes a power generator.

[89] In one embodiment, the power generator is a solar panel.

[90] In one embodiment, the solar panel is configured for charging the power source.

[91] In one embodiment, the clothes dryer includes a controller.

[92] In one embodiment, the controller is configured for actuating the motor.

[93] In one embodiment, the controller includes a processor

[94] In one embodiment, the controller includes a receiver.

[95] In one embodiment, the controller includes a transmitter.

[96] In one embodiment, the controller includes digital storage media for storage of data and/or digital instructions.

[97] In one embodiment, the controller is configured with control sequences for setting washing out and/or bringing washing in.

[98] In one embodiment, the controller is configured to have the control signals actuated by remote actuation over a network.

[99] In one embodiment, the control sequences are preprogrammed.

[100] In another aspect, the present invention may be said to consist in a clothes drying rack for hanging clothes from a construction including a window and an outer wall extending below the window, the clothes drying rack comprising:

- a. a mounting arrangement configured for securely mounting the clothes drying rack to a fixed structure in use,
- b. a supporting arrangement, the supporting arrangement being configured for supporting an elongate horizontal sliding member in at least a horizontally sliding fashion;
- c. a clothes hanging arrangement for hanging clothes on, the clothes hanging arrangement being mounted on a powered movable support arrangement, wherein the powered movable support arrangement is configured for moving

the clothes hanging arrangement between at least a deployed position and a retracted position; and

- d. a controller configured for controlling operation of the powered movable support arrangement.

[101] In one embodiment, the controller is configured for remote actuation.

[102] In one embodiment, the controller is configured for communication with the Internet.

[103] In one embodiment, the controller is configured with preprogrammed sequences for moving the powered movable support arrangement to move between its deployed position and retracted position.

[104] In another aspect, the invention may be said to consist in a clothes drying rack for hanging clothes from a construction including a window and an outer wall extending below the window, the clothes drying rack comprising:

- a. a mounting arrangement configured for securely mounting the clothes drying rack to a fixed structure in use;
- b. a clothes hanging arrangement for hanging clothes on, the clothes hanging arrangement including an elongate horizontal sliding member; and
- c. a supporting arrangement, the supporting arrangement being configured for supporting the elongate horizontal sliding member in a horizontally sliding fashion.

[105] In another aspect, the invention may be said to consist in a clothes drying rack for hanging clothes from a construction, the clothes drying rack comprising:

- a. a mounting arrangement configured for securely mounting the clothes drying rack to the construction in use,
- b. a supporting arrangement, the supporting arrangement being configured for supporting an elongate horizontal sliding member in a horizontally sliding fashion;
- c. a clothes hanging arrangement for hanging clothes on, the clothes hanging arrangement including an elongate horizontal sliding member, the elongate horizontal sliding member being configured for being supported by the supporting arrangement in a sliding fashion.

[106] In one embodiment, the supporting arrangement includes a horizontal support arrangement configured for supporting the elongate horizontal sliding member to move in a horizontally sliding fashion.

[107] In one embodiment, the supporting arrangement includes a vertical support arrangement configured for supporting the clothes hanging arrangement to move between an upper position and a lower position.

[108] In one embodiment, the supporting arrangement includes at least one or more rollers for facilitating the sliding movement of the elongate horizontal sliding member.

[109] In one embodiment, the vertical support arrangement includes a vertical adjustment mechanism configured for enabling the adjustment of the height of the clothes hanging arrangement in use.

[110] In one embodiment, the vertical adjustment mechanism includes a telescoping arrangement.

[111] In one embodiment, the telescoping arrangement includes a plurality of telescoping members.

[112] In one embodiment, the vertical adjustment mechanism includes a height adjustable elongate member.

[113] In one embodiment, the vertical support arrangement includes a vertical support member.

[114] In one embodiment, the height adjustable elongate member is connected to the clothes hanging arrangement.

[115] In one embodiment, the vertical adjustment mechanism includes a locking arrangement for locking the height adjustable elongate member in place.

[116] In one embodiment, the vertical support arrangement is configured for supporting the height adjustable elongate member in a vertical orientation.

[117] In one embodiment, the vertical support arrangement includes one or more selected from an aperture and a recess for receiving the height adjustable elongate member extending in a substantially vertical direction.

[118] In one embodiment, the vertical support arrangement includes a vertical support frame configured for receiving the height adjustable elongate member.

[119] In one embodiment, the vertical support frame includes one or more selected from bearings and rollers for facilitating movement of the height adjustable elongate member.

[120] In one embodiment, the one or more selected from bearings and rollers are configured for engagement with a plurality of opposed surfaces of the height adjustable elongate member.

[121] In one embodiment, the vertical support arrangement includes a tightening mechanism configured for tightening the vertical support frame against the height adjustable elongate member to ensure firm engagement of the one or more selected from bearings and rollers.

[122] In one embodiment, the vertical adjustment mechanism includes a moving mechanism for moving the clothes hanging arrangement between an upper position and a lower position.

[123] In one embodiment, the moving mechanism includes a threaded shaft.

[124] In one embodiment, the moving mechanism includes an internally threaded bushing for threaded engagement with the threaded shaft.

[125] In one embodiment, the internally threaded bushing is securely coupled to the height adjustable elongate member.

[126] In one embodiment, the moving mechanism includes a handle.

[127] In one embodiment, the moving mechanism includes a prime mover.

[128] In one embodiment, the moving mechanism includes a power source.

[129] In one embodiment, the moving mechanism includes a power generator.

[130] In one embodiment, the clothes dryer includes a controller.

[131] In one embodiment, the controller is configured for actuating movement of the moving mechanism.

[132] In one embodiment, the controller is configured with control sequences for moving the clothes hanging arrangement between a deployed position and a retracted position.

[133] In one embodiment, the controller is configured to have the control signals actuated by remote actuation over a network.

[134] In another aspect, the invention may be said to consist in a clothes drying rack for hanging clothes from a construction, the clothes drying rack comprising:

- a. a mounting arrangement configured for securely mounting the clothes drying rack to the construction in use,
- b. a clothes hanging arrangement configured for hanging clothes on, the clothes hanging arrangement being configured for movement between a deployed position and a retracted position;

- c. a powered supporting arrangement, the supporting arrangement being configured for supporting the clothes hanging arrangement to move between a deployed position and a retracted position; and
- d. a controller configured for controlling operation of the powered movable support arrangement.

[135] This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more of said parts, elements or features, and where specific integers are mentioned herein which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

[136] To those skilled in the art to which the invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the scope of the invention as defined in the appended claims. The disclosures and the descriptions herein are purely illustrative and are not intended to be in any sense limiting.

[137] Other aspects of the invention are also disclosed.

Brief Description of the Drawings

[138] Notwithstanding any other forms which may fall within the scope of the present invention, preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

[139] **Figure 1** shows a top right perspective view of a first embodiment of a clothes drying rack with the clothesline in an extended position and the vertical adjustment mechanism in a lowered position;

[140] **Figure 2** shows a top right perspective view of the clothes drying rack of figure 1, with the clothesline in a retracted position and the vertical adjustment mechanism in an upper position;

[141] **Figure 3** shows a top right perspective view of a second embodiment of a clothes drying rack, with the clothesline in an extended position;

[142] **Figure 4** shows a top right perspective view of a third embodiment of a clothes drying rack, with the clothesline in an extended position and the vertical adjustment mechanism in an upper position;

[143] **Figure 5** shows a close-up view of a mounting arrangement connected to tubular formations;

[144] **Figure 6** shows a cross-sectional cutaway front view of fourth embodiment of a clothes drying rack including a telescopic supporting arrangement, with the supporting arrangement in an extended position;

[145] **Figure 7** shows a front view of the clothes drying rack of figure 6, with the supporting arrangement in an extended position;

[146] **Figure 8** shows a cross-sectional cutaway front view of the clothes drying rack of figure 6, with the supporting arrangement in the retracted position;

[147] **Figure 9** shows a top right perspective cutaway view of a horizontal support member including rollers;

[148] **Figure 10** shows a top right close-up perspective view of a second embodiment of a mounting arrangement;

[149] **Figure 11** shows a top front close-up perspective view of the second embodiment of a mounting arrangement shown in figure 10;

[150] **Figure 12** shows a top right perspective view of the mounting arrangement of figure 10;

[151] **Figure 13** shows a top right close-up perspective view of a third embodiment of a mounting arrangement;

[152] **Figure 14** shows a top right perspective view of a fifth embodiment of a clothes drying rack with the clothesline in an extended position and the vertical adjustment mechanism in a lower position;

[153] **Figure 15** shows a right elevation view of a sixth embodiment of a clothes drying rack mounted on an outer wall of a construction, with the clothesline in an extended position and the vertical adjustment mechanism in a lower position;

[154] **Figure 16** shows a right elevation view of the clothes drying rack of figure 15 mounted on an outer wall of a construction, with the clothesline in an extended position and the vertical adjustment mechanism in an upper position;

[155] **Figure 17** shows a right elevation view of a seventh embodiment of a clothes drying rack mounted on the ceiling of an apartment in a construction;

[156] **Figure 18** shows a top left perspective view of an eighth embodiment of a clothes drying rack mounted on an outer wall of a construction, with the clothesline in an extended position and the vertical adjustment mechanism in an upper position;

[157] **Figure 19** shows a top left perspective view of the clothes drying rack of figure 18 with the clothesline in a retracted position and the vertical adjustment mechanism in an upper position;

[158] **Figure 20** shows a top left perspective view of the clothes drying rack of figure 18 with the clothesline in an extended position and the vertical adjustment mechanism in a lower position;

[159] **Figure 21** shows a close-up view of figure 19 showing the vertical adjustment mechanism;

[160] **Figure 22** shows a top left perspective view of a ninth embodiment of a clothes drying rack mounted on an outer wall of a construction, with the clothesline in an extended position and the vertical adjustment mechanism in an upper position;

[161] **Figure 23** shows a close-up front left bottom perspective view of figure 20, showing the elongate horizontal sliding member moving through the horizontal support arrangement;

[162] **Figure 24** shows a schematic view of a controller for a clothes dryer arrangement;

[163] **Figure 25** shows a flow chart of a control sequence for the controller to move the clothesline to a deployed position;

[164] **Figure 26** shows a flow chart of a control sequence for the controller to move the clothesline to a retracted position; and

[165] **Figure 27** shows a side elevation view of a tenth embodiment of a clothes drying rack mounted to an outer wall of a construction, including a brake winch as a moving mechanism.

Description of Embodiments

[166] It should be noted in the following description that like or the same reference numerals in different embodiments denote the same or similar features.

[167] A clothes drying rack according to a first aspect of the invention is generally indicated by the numeral 1000.

[168] In one embodiment now described, there is provided a clothes drying rack 1000 for hanging clothes from a construction such as an apartment block (not shown), the apartment block including a window 2200 and an outer wall 2000 extending below the window. The clothes drying rack 1000 includes a mounting arrangement 1100 in the form of a wall mount, a supporting arrangement in the form of a support frame 1200, and a clothes hanging arrangement 1300.

[169] The clothes hanging arrangement 1300 is configured for hanging clothes on and includes an elongate horizontal sliding member 1310 as well as a pair of transverse members or transverse struts 1330 extending transversely from the elongate horizontal sliding member 1310 at each end. Preferably, a plurality of clotheslines 1320 extend between the transverse members 1330, in parallel with the elongate horizontal sliding member 1310.

[170] The clothes hanging arrangement 1300 is slidable relative to the supporting arrangement 1200 between an extended position as **shown in figures 1, 3 and 4**, in which the clothes hanging arrangement 1300 preferably extends outwardly of the outer wall of the construction, and a retracted position **as shown in figure 2** in which the clothes hanging arrangement 1300 is preferably receivable within a zone inwardly of the outer wall of the construction, and preferably receivable into a window of a flat or apartment, for example.

[171] The mounting arrangement 1100, or wall mount, is configured for securely mounting the clothes drying rack 1000 to the outer wall 2000 of an apartment block in use, preferably below a window 2200. More preferably, the mounting arrangement 1100 is configured for mounting two tubular formations 2100 extending from the outer wall, as are commonly found in Singapore. In an alternative embodiment (not shown), the mounting arrangement can be configured for mounting to one, three or any number of tubular formations.

[172] In a preferred embodiment **shown in figures 5**, the mounting arrangement 1100 includes mounting formations in the form of U-bolts 1110 that are configured for mounting over a pair of tubular formations 2100, as well as cross struts 1120 that extend between the tubular formations 2100, and onto which the U-bolts are connected by nuts 1112. The supporting frame 1200 is also mounted onto the cross struts 1120.

[173] In another embodiment (not shown), the mounting formations 1110 can include a locking mechanism (not shown) for locking the mounting arrangement 1100 to the tubular formations 2100. The locking mechanism can include one or more threaded screws (not shown) that is screwable into a complementarily threaded hole in the mounting arrangement 1100 to firmly engage with the tubular formations 2100, to thereby prevent removal of the mounting arrangement 1100 from the tubular formations.

[174] In an alternative embodiment (not shown), it is envisaged that the mounting formations could be configured for mounting into the tubular formations 2100.

[175] In the embodiment **shown in figures 10 – 12**, the mounting arrangement 1100 includes a mounting plate 1130 that is mounted over, and extending around, the tubular formations 2100. The mounting arrangement 1100 includes a pair of cylindrical sleeves 1136 that are configured for a snug fit over the tubular formations 2100. Each of the cylindrical

sleeves 1136 are patentable onto the tubular formations 2100 by tightening bolts 1139. A mounting washer is provided to fit the cylindrical sleeves and pivoting against the wall. Each of the cylindrical sleeves 1136 is pivotably mounted to a mounting washer 1137 by pivot bolts 1138 (**shown in close-up in figure 12**). The mounting washer 1137 is abutted snugly against the mounting plate 1130 in use. In this manner, variances in the angle that the tubular formations extend from the construction, as well as distances between the tubular formations, can be taken into account.

[176] In the embodiment **shown in figure 13**, the mounting formation is a mounting plate 1130 that is mounted directly to the outer wall 2000 by bolts 1134 and not to the tubular formations 2100, with the tubular formations 2100 extending through apertures 1132. In the embodiment **shown in figure 13**, the mounting plate 1130 extends around the tubular formations 2100, although this need not necessarily be the case.

[177] The supporting frame 1200 is configured for supporting the elongate horizontal sliding member in a substantially horizontal orientation, to allow it to move substantially horizontally in a sliding fashion. Preferably, as **shown in figures 1- 4, 6, 8 and 9**, the supporting frame 1200 includes a horizontal support arrangement 1240. The horizontal support arrangement includes a horizontal support member 1244 that preferably defines an aperture 1242. The aperture 1242 is adapted to receive the elongate horizontal sliding member 1310 horizontally through it in use. It is envisaged that the horizontal support member 1244 can also include bearings (not shown) or bushes (not shown) for facilitating the sliding movement of the elongate horizontal sliding member 1310 through the horizontal support member 1240.

[178] In the embodiment **shown in figure 9**, the supporting frame 1200 includes a series of rollers 1215 mounted on roller axles 1217 that serves to hold and guide movement of the elongate horizontal sliding member 1310. In an alternative embodiment (not shown), the supporting frame 1200 need not necessarily define an aperture for the elongate horizontal sliding member to extend through, but could include a recess instead.

[179] The supporting frame 1200 also includes a vertical support arrangement 1205 for enabling the movement of the clothes hanging arrangement 1300 between an upper position and a lower position. The vertical support arrangement includes a vertical adjustment mechanism 1220. The vertical adjustment mechanism 1200 is adapted to allow for the adjustment of the height at which the horizontal support member 1244 is held. The vertical adjustment mechanism 1220 allows for the horizontal support member 1244 to be held at a height in alignment with the window 2200, for example to allow the elongate horizontal sliding member 1310 to be retracted inwardly through the window 2200 when the window is

open, to facilitate the loading of the clotheslines with items to be dried (**not shown**). The vertical adjustment mechanism 1220 also preferably allows the horizontal support member 1244 to be moved out of alignment with the window 2200, for example to allow the windows to be closed.

[180] In the embodiment **shown in figures 1,2 and 4**, the vertical adjustment mechanism 1220 includes a hollow vertical support member 1224. The hollow vertical support member 1224 defines an aperture (not shown) through which an elongate height adjustable member 1222 is adjustably receivable. Preferably, the elongate height adjustable member 1222 includes a locking arrangement in the form of holes (not shown) that can be aligned with complementary holes (not shown) in the vertical support member 1224, and a locking pin (not shown) inserted, to thereby lock the elongate height adjustable member 1222 in position.

[181] In the embodiment **shown in figure 3**, the support frame 1200 does not include a vertical adjustment mechanism, and instead is configured to hold the horizontal support member 1244 at a constant height on a fixed elongate member 1210. However, this embodiment is not preferred, as it does not allow for opening and/or closing of windows of the construction that is mounted to, in a manner that will be detailed below.

[182] In an alternative embodiment as **shown in figures 6 – 8**, the vertical adjustment mechanism is a telescoping arrangement or telescoping mechanism 1250. The telescoping mechanism 1250 includes a fixed member 1252 that is securely mounted to the mounting arrangement 1100, and a telescoping member 1254 that is configured to move relative to the fixed member 1252 between a retracted position as **shown in figure 8**, and an extended position as **shown in figures 6 and 7**.

[183] Preferably, the fixed member 1252 includes internal rollers 1256 in a configuration similar to that shown with reference to the horizontal support member 1244 in **figure 9**, the internal rollers 1256 being configured for facilitating the smooth telescoping movement of the telescoping member 1254 between the retracted position and the extended position.

[184] The telescoping mechanism 1250 in **figure 6 and 8** is provided with a gas strut 1258 that extends internally of both of the fixed member 1252 and the telescoping member 1254, and between the fixed member 1252 and the telescoping member 1254. The gas strut preferably includes a piston (not shown) movable within a cylinder (not shown), a damping circuit (not shown) and an internal spring (not shown), as is well known in the art. The damping circuit preferably prevents the telescoping member 1254 from falling in an unrestrained manner to its retracted position. The internal spring preferably assists in the lifting up of the telescoping member 1254, together with the clothes hanging arrangement

1300, to its extended position. This will be especially useful where the clothes hanging arrangement 1300 has washing (not shown) hanging on the clotheslines 1320 and may be heavy to pull up from the window 2200 above it. In the embodiment **shown in figure 7**, a pair of gas struts is provided.

[185] Another embodiment of a vertical adjustment mechanism 1220 is **shown in figures 15 and 16**. In this embodiment, the vertical adjustment mechanism 1220 includes an outer mounting formation in the form of a vertical support member 1232 similar to the vertical support member 1224 shown with reference **to figures 1 – 5**, in that the vertical support member 1232 is configured for receiving a height adjustable elongate member 1222 that can be used to adjust the height of the horizontal support member 1240 by moving in a direction **shown by arrow H in figure 15**. However, the vertical support member 1224 is connected to and makes up part of, a collapsible frame 1230 that, when viewed from the side as **shown in figures 15 and 16**, can be seen to be configured as a collapsible trapezoidal frame 1230. In this embodiment, the collapsible frame acts as the vertical adjustment mechanism 1220, while the movement of the height adjustable elongate member 1222 through the vertical support member is more for fine adjustment of the height at which the clothes hanging arrangement 1300 moves to.

[186] The collapsible frame 1230 is made up of the vertical support member 1232 that is pivotably connected at or towards its upper and lower end to a pivoting strut 1234. The pivoting strut 1234 is in turn pivotably connected to a mounting arrangement, in the form of a mounting plate 1233 that can be bolted to the wall or attached to the tubular formations in a similar manner as described above.

[187] The pivoting struts 1234 are pivotably connected to the vertical support member 1232 at one end and the mounting plate 1233 at an opposed end by hinges 1236. In this way, the vertical adjustment mechanism 1220 is movable between a lower position as **shown in figure 15** in which the pivoting struts 1234 are substantially horizontal, and an upper position **as shown in figure 16** by pivoting the pivoting struts 1234 in a direction **shown by arrows P in figure 15**. It will be appreciated by those skilled in the art that, as the vertical adjustment mechanism 1220 moves between its upper position and lower position, the vertical support member 1232 is held in a substantially upright position (i.e. in a horizontal alignment). Further, in this embodiment, détentes 1238 are provided for preventing movement of the pivoting struts 1234 past the horizontal when moving from the upper position to the lower position. A resilient elongate member 1237 in the form of a rope, chain, or similar is provided for a user to pull on to raise the vertical adjustment mechanism 1222 its upper position. A latch formation 1239 is also provided for latching the vertical

adjustment mechanism in its upper position, so that a user can move the clothes hanging arrangement between its extended position and retracted position.

[188] It is envisaged that in an alternative embodiment (**not shown**) the vertical adjustment mechanism could make use of a gear cog and complementary chain arrangement, whereby the gear cog and be rotated by a handle to cause the chain to wind and unwind, thereby raising or dropping a vertical support member. However, the complexity of this arrangement is not preferred.

[189] In another embodiment is **shown in figure 17**, the clothes drying rack 1000 is mountable inside of the construction, for example on a ceiling 2300 or some other inner surface of a wall of the construction, preferably by fasteners such as bolts (not shown). In the embodiment shown, the mounting arrangement 1100 includes a mounting plate 1130 that is mounted to a ceiling 2300 inside an apartment. The supporting arrangement 1200 includes a vertical adjustment mechanism 1220 in the form of a telescoping mechanism 1250 similar to the telescoping mechanism described above. The telescoping mechanism allows the clothes hanging arrangement 1300 to be moved downwardly (**shown by arrow A in figure 17**) from being close to the ceiling 2300 position in which close can be conveniently hung on the clotheslines. The close hanging arrangement 1300 can then be slid to an extended position outside of the window as **shown by arrow B in figure 17**.

[190] In operation, it is envisaged that the clothes drying rack 1000 will be mounted to an outer wall of a construction, such as a flat or apartment, with the vertical adjustment mechanism 1220 in a lower position, and the clothes hanging arrangement 1300 in an extended position. A user will open a window 2200 of the construction (**shown by arrow O in figures 15-17**), which will be possible as the vertical adjustment mechanism has enabled the clothes drying rack 1000 to be out of the way of the window as it opens outwardly. The user will then operate the vertical adjustment mechanism 1220 to raise the clothes hanging arrangement 1300 to a level in alignment with the window 2200. The clothes hanging arrangement 1300 will then be moved to its retracted position in which it slides through the window, and inwardly of the construction. In this position, washing to be dried can be conveniently hung on the clotheslines 1320. Once the clothes have been hung, the clothes hanging arrangement 1300 will be moved manually to its extended position outwardly of the outer wall 2000 of the construction. The vertical adjustment mechanism 1220 can then be optionally operated to move the clothes hanging arrangement 1300 to a level below that of the window 2200 if the window is intended to be closed.

[191] In another embodiment **shown in figures 18 – 21**, the vertical adjustment mechanism 1220 is provided as a vertical support arrangement or vertical support frame

1229. The vertical support frame 1229 is configured for supporting the height adjustable elongate member 1222 in a substantially vertical orientation, while allowing the height adjustable elongate member 1222 to move between an upper position and a lower position. The height adjustable elongate member 1222 is receivable through a passage or aperture through the vertical support frame 1229. The vertical support frame 1229 is composed of four vertical frame members 1226 that are coupled together by threaded shafts 1227 and fastened by nuts 1228 threadedly engaging on opposed ends of the threaded shafts. The vertical members 1226 are securely connected to the mounting arrangement or wall mount 1100 by transverse horizontal frame members 1221.

[192] Rollers 1225 are provided on some of the threaded shafts 1227 to engage against preferably four opposed faces of height adjustable elongate member 1222. The rollers 1225 are for facilitating the smooth movement of the height adjustable elongate member 1222 to move the clothes hanging arrangement 1300 between an upper position and a lower position.

[193] Some of the threaded shafts 1227 are not provided with rollers. The function of these threaded shafts is to act as a tightening mechanism together with the complementary threaded nuts 1228, to ensure that the rollers 1225 engage firmly with the opposed faces of the height adjustable elongate member 1222 so that the height adjustable elongate member 1222 (and by extension the clothes hanging arrangement 1300) does not move around or wobble, for example in strong winds. The threaded nuts 1228 are preferably tightened against an outer face of the vertical frame members 1226 to drive them closely together.

[194] In the embodiment **shown in figures 18 – 21**, the vertical adjustment mechanism 1220 further includes a moving mechanism 1270. The moving mechanism 1270 is configured for driving movement of the clothes hanging arrangement 1300 between its upper position and lower position.

[195] The moving mechanism 1270 includes a threaded shaft 1272 that is engageable with a bushing 1274 that has internal thread formations (**not shown**) complementary to the threaded shaft thread formations. The internally threaded bushing 1274 is rigidly connected to a bottom end of the height adjustable elongate member 1222 by transverse members 1276 and plate 1277 so that, when the internally threaded bushing 1274 moves upwardly and/or downwardly, the height adjustable elongate member 1222 will move with it.

[196] The threaded shaft 1272 is securely mounted to the mounting arrangement 1100 on horizontal mounting bars 1260 in a rotatable fashion. At a top end of the threaded shaft 1272, a handle 1278 is mounted to rotate with the shaft. Threaded shaft 1272 extends through apertures in the horizontal mounting bars 1260. The threaded shaft 1272 includes a

pair of preferably threaded mounting nuts 1279 that are securely connected to the threaded shaft by a grub screw (not shown) extending through the mounting nuts 1279 and tightened against the threaded shaft 1272, so that they threaded mounting nuts 1279 will rotate with the threaded shaft 1272.

[197] The mounting nuts 1279 are spaced apart from each other to seat on an upper surface of the horizontal mounting bars 1260, thereby preventing the threaded shaft 1272 from moving further downward. The threaded shaft 1272 is freely movable within the apertures in the horizontal mounting bars 1260.

[198] In alternative embodiments (not shown), it will be appreciated by a person skilled in the art that a wide variety of alternative configurations to such mounting nuts could be provided. For example, each of the mounting nuts could be replaced with flange. Such a flange could be integrally formed with the threaded shaft, or alternatively could be connected to the threaded shaft, for example by welding.

[199] Rotational movement of the handle 1278 will cause rotation of the threaded shaft 1252. The thread formations of the threaded shaft will engage with the internal thread formations of the threaded bushing 1274. However, since the threaded bushing 1274 is held in position by the transverse members 1276 and plate 1277, the rotational movement of the threaded shaft will cause the threaded bushing 1274 to move either upwardly or downwardly, depending on the direction of rotation of the threaded shaft.

[200] Upward or downward movement of the threaded bushing 1274 will cause the same upward or downward movement of the height adjustable elongate member 1222 between an upper position and a lowered position, moving through the vertical support frame 1229. This in turn will cause movement of the clothes hanging arrangement 1300 between an upper position and a lower position.

[201] An advantage of this configuration is that a small amount of force is required to turn the threaded shaft, allowing for relatively weak users to operate the moving mechanism 1270. The location of the handle 1278 remains constant, and is preferably located in use just below the level of the window 2200, allowing operation of the moving mechanism by a user without having to lean too far out of the window as to be dangerous. Preferably, the threaded shaft 1272 will have relatively coarse threads, allowing for relatively large movements of the clothes hanging arrangement for each turn of the threaded shaft. In this way, the threaded shaft could be looked at as a worm gear-type arrangement.

[202] A further advantage of this configuration is that unintended movement of the clothes hanging arrangement 1300 is unlikely because of the leverages inherent to the configuration.

[203] It will be apparent to persons skilled in the art that a wide variety of alternative moving mechanisms could be provided. For example, the threaded shaft could be replaced by a worm gear on a shaft. Rotational movement of the shaft using a handle could cause the worm gear to drive a gear cog, which could in turn be translated to the linear upward or downward movement by a rack and pinion mechanism. However, such configurations are regarded as being too complex and costly.

[204] In the embodiment **shown in figure 22**, the handle is replaced by a prime mover in the form of an electrical motor 1275. The clothes dryer 1000 is provided with its own power generator in the form of a solar panel 1410 and/or wind driven turbine generator 1420 (**shown in figure 24**), that operates through a battery charger 1415 to charge a power source, for example in the form of a battery 1273 and/or capacitor. The solar panel can be configured to recharge the battery as is known in the art. In an alternative embodiment the electrical motor 1275 may be configured to be connected to and receive power from a mains electrical supply, for example provided from inside the apartment.

[205] It is further envisaged that in a further embodiment (**not shown**) a similar arrangement including a moving mechanism for moving the elongate horizontal sliding member 1310 between its extended position and its retracted position can be provided. For example, an electrical motor operating the rotation of a threaded shaft to engage with a threaded bushing attached to the clothes hanging arrangement 1300 could be provided for moving the elongate horizontal sliding member 1310. Alternately any other similar moving mechanism such as a worm gear driving a rack and pinion or similar could be used.

[206] In the embodiment **shown in figure 22**, the clothes dryer 1000 also includes a controller 1400 that is configured for controlling operation of the electrical motors that control movement of the height adjustable elongate member 1222 and/or the elongate horizontal sliding member 1310 and /or the window or window sash via electrical motors.

[207] Mechanisms for the opening and/or closing of windows or window sashes by electrical motors are known, and a description of this is considered beyond the scope of this specification.

[208] As **shown in figure 24** the controller 1400 preferably has an associated processor 1430 and digital storage media 1440 configured for controlling operation of the processor to cause control sequences to be carried out. The operation of controllers to control electrical motors is well-known, and a discussion on the operation of the controller is considered beyond the scope of this specification.

[209] Preferably, the controller 1400 includes a transceiver 1450, preferably in the form of a wireless communications chip such as a Wi-Fi chip configured for communicating using

any of the IEEE802.11 protocols, and an associated antenna 1460. In alternative embodiments, more long-range network transceivers are envisaged, such as cellular network enabled chips operating on any of the 3G, 4G, 5G, LTE or similar protocols can be used. Alternatively, it is envisaged that the controller can be connected directly to the Internet via a router by hardwire, for example through an Ethernet connection.

[210] The controller 1400 preferably includes an input/output interface 1470 that enables connection to external devices, such as visual and/or audio outputs, preferably in the form of LED lights 1472, a display screen 1474, a speaker 1476 and an emergency stop button 1478. In addition, the controller 1400 may be provided with sensors including any one or more selected from:

- a. vibration sensor 1480,
- b. accelerometer 1490,
- c. pressure sensor 1500
- d. humidity sensor 1510
- e. temperature sensor 1520
- f. ambient light sensor 1530,
- g. proximity sensor 1560, and/or
- h. wind speed sensor 1540.

[211] Preferably, the controller is connectable to a data and/or power connection via a USB-C connector port 1550.

[212] In addition, it is envisaged that the controller 1400 could be configured for controlling operation of the window 2200 to move between an open position and a closed position. It is further envisaged that the controller can be configured with control sequences for putting washing out to dry (as **shown in figure 25**) in a deployed position after receiving 10 an actuation signal by, for example, opening 20 the window, moving 30 the elongate horizontal sliding member 1310 to its extended position; moving 40 the height adjustable elongate member 1222 to its lowered position; and optionally closing 50 the window.

[213] Another sequence could be provided for bringing washing in (as **shown in figure 26**) and moving the clothes drying arrangement 1000 to a retracted position after receiving 60 an actuation signal by, for example, optionally opening 65 the window; moving 70 the height adjustable elongate member 1222 to its upper position; and moving 75 the elongate horizontal sliding member 1310 to its retracted position, thereby moving the clothes hanging arrangement 1300 in through the open window.

[214] It is envisaged that the controller will cause a visual and audial warning alert to be transmitted on actuation of such a sequence. Further, it is envisaged that the emergency stop button will be able to be actuated in order to stop any such sequence being carried out in the case of an emergency. Further, it is envisaged that one or more proximity sensors 1560 can be placed to detect whether movement of the clothes hanging arrangement 1300 between its extended position and retracted position and/or between its upper position and lower position is obstructed. On detection of such an obstruction, the control sequence can be cancelled to stop all movement.

[215] It is further envisaged that the controller could be configured with a transceiver (not shown) for connection (either wirelessly or hardwired) to a network to thereby enable remote actuation of the controller of various sequences. In turn, actuation of control sequences could be carried out remotely by a user, for example by input of a command on a remote mobile phone via a downloaded app. In this way, it is envisaged that, for example, if a user is not at home, and it is threatening to rain, they can open the app on their mobile phone, and actuate the control sequence for bringing in the washing. This actuation will be relayed to the controller, which in turn will cause the washing to be moved into the apartment.

[216] In **figures 18-20 and 22**, another embodiment of a horizontal support arrangement 1240 is shown, including a horizontal support frame 1246 that is similar in configuration to the vertical support frame 1229 **shown in figures 18-21**. The horizontal support frame 1246 includes rollers mounted on threaded rods that can be tightened by nuts to ensure firm engagement of the rollers with the horizontal sliding member 1310.

[217] Another embodiment of a clothes dryer 1000 is **shown in figure 27**. In this embodiment, the moving mechanism 1270 includes a brake winch 1280. The brake winch 1280 includes a winching mechanism (**not shown**) housed within a winch drum 1282 and housing, a cable 1284, and a winching handle 1286. One end of the cable 1284 is coupled to a lower portion of the height adjustable elongate member 1222, and the opposed end of the cable 1284 is coupled to the winch drum 1282. The winch drum 1282 is preferably mounted at a high level on the mounting arrangement 1100, and above the bottom of the height adjustable elongate member 1222, thereby allowing the brake winch 1280 to move the lower portion of the height adjustable elongate member 1222 upwardly as the winch is used to pull upwardly on the cable. When the winch 1280 is reversed, the weight of the clothes hanging arrangement 1300 and the height adjustable elongate member 1222 will cause it to move downwardly through the vertical support arrangement.

[218] In an alternative embodiment (**not shown**) the winching handle may be replaced by a prime mover such as an electric motor, and controlled by a controller as described above.

[219] Brake winches are known in the art, and preferably do not allow movement of the item being winched without requiring corresponding movement of the winch handle (or prime mover if there is a prime mover driving movement of the winch). A discussion of the internal mechanism of the brake winch is considered beyond the scope of this specification.

Interpretation

Markush Groups

[220] In addition, where features or aspects of the invention are described in terms of Markush groups, those skilled in the art will recognise that the invention is also thereby described in terms of any individual member or subgroup of members of the Markush group.

Chronological sequence

[221] For the purpose of this specification, where method steps are described in sequence, the sequence does not necessarily mean that the steps are to be carried out in chronological order in that sequence, unless there is no other logical manner of interpreting the sequence.

Embodiments:

[222] Reference throughout this specification to “one embodiment” or “an embodiment” means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases “in one embodiment” or “in an embodiment” in various places throughout this specification are not necessarily all referring to the same embodiment, but may. Furthermore, the particular features, structures or characteristics may be combined in any suitable manner, as would be apparent to one of ordinary skill in the art from this disclosure, in one or more embodiments.

[223] Similarly, it should be appreciated that in the above description of example embodiments of the invention, various features of the invention are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of one or more of the various inventive aspects. This method of disclosure, however, is not to be interpreted as reflecting an intention that the claimed invention requires more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed embodiment. Thus, the claims following the Detailed Description of Specific Embodiments are hereby expressly incorporated into this Detailed Description of Specific Embodiments, with each claim standing on its own as a separate embodiment of this invention.

[224] Furthermore, while some embodiments described herein include some but not other features included in other embodiments, combinations of features of different embodiments are meant to be within the scope of the invention, and form different embodiments, as would be understood by those in the art. For example, in the following claims, any of the claimed embodiments can be used in any combination.

Different Instances of Objects

[225] As used herein, unless otherwise specified the use of the ordinal adjectives "first", "second", "third", etc., to describe a common object, merely indicate that different instances of like objects are being referred to, and are not intended to imply that the objects so described must be in a given sequence, either temporally, spatially, in ranking, or in any other manner.

Specific Details

[226] In the description provided herein, numerous specific details are set forth. However, it is understood that embodiments of the invention may be practiced without these specific details. In other instances, well-known methods, structures and techniques have not been shown in detail in order not to obscure an understanding of this description.

Terminology

[227] In describing the preferred embodiment of the invention illustrated in the drawings, specific terminology will be resorted to for the sake of clarity. However, the invention is not intended to be limited to the specific terms so selected, and it is to be understood that each specific term includes all technical equivalents which operate in a similar manner to accomplish a similar technical purpose. Terms such as "forward", "rearward", "radially", "peripherally", "upwardly", "downwardly", and the like are used as words of convenience to provide reference points and are not to be construed as limiting terms.

[228] For the purposes of this specification, the term "plastic" shall be construed to mean a general term for a wide range of synthetic or semisynthetic polymerization products, and generally consisting of a hydrocarbon-based polymer.

[229] As used herein the term "and/or" means "and" or "or", or both.

[230] As used herein "(s)" following a noun means the plural and/or singular forms of the noun.

Comprising and Including

[231] In the claims which follow and in the preceding description of the invention, except where the context requires otherwise due to express language or necessary implication, the word "comprise" or variations such as "comprises" or "comprising" are used in an inclusive

sense, i.e. to specify the presence of the stated features but not to preclude the presence or addition of further features in various embodiments of the invention.

[232] Any one of the terms: including or which includes or that includes as used herein is also an open term that also means including at least the elements/features that follow the term, but not excluding others. Thus, including is synonymous with and means comprising.

Scope of Invention

[233] Thus, while there has been described what are believed to be the preferred embodiments of the invention, those skilled in the art will recognize that other and further modifications may be made thereto without departing from the spirit of the invention, and it is intended to claim all such changes and modifications as fall within the scope of the invention. For example, any formulas given above are merely representative of procedures that may be used. Functionality may be added or deleted from the block diagrams and operations may be interchanged among functional blocks. Steps may be added or deleted to methods described within the scope of the present invention.

[234] Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms.

Industrial Applicability

[235] It is apparent from the above, that the arrangements described are applicable to the home appliance and consumer product industries.

Claims

The claims defining the invention are as follows:

- 1. A clothes drying rack for hanging clothes from a construction, the clothes drying rack comprising:**
 - a. a mounting arrangement configured for securely mounting the clothes drying rack to the construction in use,
 - b. a supporting arrangement, the supporting arrangement being configured for supporting an elongate horizontal sliding member in a horizontally sliding fashion;
 - c. a clothes hanging arrangement for hanging clothes on, the clothes hanging arrangement including an elongate horizontal sliding member, the elongate horizontal sliding member being configured for being supported by the supporting arrangement in a sliding fashion.
2. The clothes drying rack as claimed in claim 1, wherein the supporting arrangement includes a horizontal support arrangement configured for supporting the clothes hanging arrangement to move in a horizontally sliding fashion.
3. The clothes drying rack as claimed in any one of claims 1 to 2, wherein the supporting arrangement includes a vertical support arrangement configured for supporting the clothes hanging arrangement to move between an upper position and a lower position.
4. The clothes drying rack as claimed in any one of claims 1 to 3, wherein the supporting arrangement includes at least one or more rollers for facilitating the sliding movement of the elongate horizontal sliding member.
5. The clothes drying rack as claimed in any one of claims 3 to 4, wherein the vertical support arrangement includes a vertical adjustment mechanism configured for enabling the adjustment of the height of the clothes hanging arrangement in use.
6. The clothes drying rack as claimed in claim 5, wherein the vertical adjustment mechanism includes a telescoping arrangement.
7. The clothes drying rack as claimed in claim 6, wherein the telescoping arrangement includes a plurality of telescoping members.
8. The clothes drying rack as claimed in any one of claims 5 to 7, wherein the vertical adjustment mechanism includes a height adjustable elongate member.

9. The clothes drying rack as claimed in any one of claims 5 to 8, wherein the vertical support arrangement includes a vertical support member.
10. The clothes drying rack as claimed in any one of claims 8 to 9, wherein the height adjustable elongate member is coupled to the clothes hanging arrangement.
11. The clothes drying rack as claimed in any one of claims 5 to 10, wherein the vertical adjustment mechanism includes a locking arrangement for locking the height adjustable elongate member in place.
12. The clothes drying rack as claimed in any one of claims 5 to 10, wherein the vertical support arrangement is configured for supporting the height adjustable elongate member in a vertical orientation.
13. The clothes drying rack as claimed in any one of claims 5 to 10, wherein the vertical support arrangement includes one or more selected from an aperture and a recess for receiving the height adjustable elongate member extending in a substantially vertical direction.
14. The clothes drying rack as claimed in any one of claims 5 to 10, wherein the vertical support arrangement includes a vertical support frame configured for receiving the height adjustable elongate member.
15. The clothes drying rack as claimed in claim 14, wherein the vertical support frame includes one or more selected from bearings and rollers for facilitating movement of the height adjustable elongate member.
16. The clothes drying rack as claimed in claim 15, wherein the one or more selected from bearings and rollers are configured for engagement with a plurality of opposed surfaces of the height adjustable elongate member.
17. The clothes drying rack as claimed in claim 16, wherein the vertical support arrangement includes a tightening mechanism configured for tightening the vertical support frame against the height adjustable elongate member to ensure firm engagement of the one or more selected from bearings and rollers.
18. The clothes drying rack as claimed in any one of claims 5 to 17, wherein the vertical adjustment mechanism includes a moving mechanism configured for moving the clothes hanging arrangement between an upper position and a lower position.
19. The clothes drying rack as claimed in claim 18, wherein the moving mechanism includes a threaded shaft.

20. The clothes drying rack as claimed in claim 19, wherein the moving mechanism includes an internally threaded bushing for threaded engagement with the threaded shaft.
21. The clothes drying rack as claimed in claim 20, wherein the internally threaded bushing is securely coupled to the height adjustable elongate member.
22. The clothes drying rack as claimed in any one of claims 18 – 21, wherein the moving mechanism includes a handle.
23. The clothes drying rack as claimed in any one of claims 18 – 22, wherein the moving mechanism includes a prime mover.
24. The clothes drying rack as claimed in any one of claims 18 – 23, wherein the moving mechanism includes a power source.
25. The clothes drying rack as claimed in any one of claims 18 – 24, wherein the moving mechanism includes a power generator.
26. The clothes drying rack as claimed in claim 26, wherein the clothes dryer includes a controller configured for actuating movement of the moving mechanism.
27. The clothes drying rack as claimed in claim 26, wherein the controller is configured with control sequences for moving the clothes hanging arrangement between a deployed position and a retracted position.
28. The clothes drying rack as claimed in claim 18, wherein the moving mechanism includes a brake winch including a winch drum, a winching mechanism and a cable.
29. The clothes drying rack as claimed in claim 28, wherein the cable is coupled to a lower portion of the height adjustable elongate member to pull the height adjustable elongate member upwardly.
- 30. A clothes drying rack for hanging clothes from a construction including a window and an outer wall extending below the window, the clothes drying rack comprising:**
 - a. a mounting arrangement configured for securely mounting the clothes drying rack to a fixed structure in use;
 - b. a clothes hanging arrangement for hanging clothes on, the clothes hanging arrangement including an elongate horizontal sliding member; and
 - c. a supporting arrangement, the supporting arrangement being configured for supporting the elongate horizontal sliding member in a horizontally sliding fashion.

31. A clothes drying rack for hanging clothes from a construction, the clothes drying rack comprising:

- a. a mounting arrangement configured for securely mounting the clothes drying rack to the construction in use,
- b. a clothes hanging arrangement configured for hanging clothes on, the clothes hanging arrangement being configured for movement between a deployed position and a retracted position;
- c. a powered supporting arrangement, the supporting arrangement being configured for supporting the clothes hanging arrangement to move between a deployed position and a retracted position;
- d. a controller configured for controlling operation of the powered movable support arrangement.