

CLOTHES-DRYING STRUCTURE RACK AND METHOD THEREOF**Field of the Invention**

5 The invention in general relates to a clothes-drying structural rack and a method for inserting or retrieving a clothes-drying pole with wet washed clothes into/from a pipe socket for outdoor drying being carried out by an occupant in a building. A ledge-rail support by the rack provides for a resting, sliding and guiding for the pole during the executing process for
10 assisting and conveniences in inserting or retrieving the pole into/from the socket. The rack mounted on the exterior wall of a building below the sockets achieves convenience for the occupants and functionality, while further enhancing safety and aesthetics.

Description of Related Art

15 Clothes-drying pole, rack, structure, device and holder are in general known. For example, various types of these devices are described in GB 2305853 B, JP 10143696, US 5971170, EP 916297 A1, JP 9327597 A2, JP 9327593 A2, JP 10094697 A2, and JP 6142394 A2.

20 Stringent safety requirements of various types are enforced throughout all countries for the protection of occupants in a residential building. Regarding the safety requirements, parapet and balustrades walls having a safety barrier of not less than 900 mm high have to be installed at each floor opening. In general practice, a non-climbable design ranges from 1000 mm for service balconies to 1200 mm for common corridors. A general requirement for loading on the
25 external parapet wall in an occupancy building is that the wall be able to resist a lateral outwards force or thrust of 1.0 kN/m^2 .

Typical inclined socket has a diameter of 38 mm, a thickness of 3 mm, is made of stainless steel and is embedded inside a reinforce concrete exterior building wall of 100 mm thickness.

30 The socket remains below the top bars of the wall with sufficient concrete cover, protrudes slightly 135 mm from the wall and is inclined in an upward direction at an average angle of 12° - 15° . These sockets welded in a row together with horizontally oriented mild-steel bars are secured in the middle and lapped into adjacent concrete wall. Self-draining apparati are included in the embedded sockets to the internal ends for trapping water collected during rainy
35 days from the short protruding socket's opening. A plate welded to the lowest end limits the insertion length of the pole.



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The inclining angle of the socket ensures that the pole, when cantilevered, is held tightly, containing it within the socket's internal wall and does not dislodge under normal circumstances. This anchoring method as observed with the sockets in general far exceeds sufficient abilities to cantilever the pole.

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In general, this anchoring depends on the practices of each individual occupant, the physical height of the carrier, the weight of the wet wash clothes on the pole to be maneuvered, and the depth one end of the pole to be inserted into socket to be cantilevers for outdoor drying.

10 The sockets for the poles are generally arranged from 200 mm - 250 mm apart in a row of 4 to 7 numbers with sufficient arm movements from an adjacent window leaf or wall and attached below an operable casement window sash when in the inserted position. The insertion height of the pole into the socket's opening is about 850mm to 920mm from outer top level of the socket's opening to internal floor of a building.

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Clothes drying poles are available commercially of various lengths of 2100mm – 2400mm and are made of either extruded aluminum tubing or of natural bamboo. In general carry various load to cantilevers from the socket for outdoor drying. An example of an aluminum pole as observed having a diameter of about 25mm, a wall thickness of about 0.8mm, a
20 general length of about 2400mm and a weight of about 0.4kg.

Summary of Invention

It is an object of the present invention to provide a clothes-drying structure rack and a method
25 thereof with convenience and functionality for the occupants and to further enhances measured safety standards and aesthetics. Further, the rack is improved in carrying abilities for outdoor drying and does not consume valuable living space. It should be attractive in appearance and desirable to current manufacturing process and, accordingly, be manufacturable from various materials. Ideally it should provide an attachment plane that
30 permits various sizes and shapes.

According to the present invention, this is achieved by a method for inserting the pole carrying wet washed clothes into the upwardly inclined pipe socket embedded in an external wall of a building, the method comprising the steps of:

- 35 (a) spreading wet washed clothes along the pole inside a building unit, and
(b) carrying the pole with clothes externally to allow an end portion of the pole to be thrust inwards into the pipe socket's opening,

wherein the **improvement** comprises the steps of:

- (c) resting the pole on a support,
- (d) sliding the pole seesawing inwardly towards the socket's wall,
- (e) guiding short end portion of the pole into the inclined socket's opening,
- 5 (f) inserting inner end portion of the pole towards the inward end of the pipe socket,
- (g) drying the washed on pole, being remote to the rack and not being supported by the support when fully inserted for drying, and

whereby the pole is accommodated with its end portion inside the inclined socket which cantilevering the pole with wet wash clothes for outdoor drying and vice versa for
10 retrieving by the support provided.

The rack for using on the wall of a building is provided, the wall having at least one pipe socket being embedded therein so as to project outwardly from the wall in an upward direction, wherein the rack comprises the pole accommodated with its end portion in the pipe
15 socket.

The rack, generally in U-shaped having two supporting arms and the support which is a pole guiding ledge-rail being attached with its end portions to respective end portions of the supporting arms, wherein the rack is mounted on the wall of the building so that the ledge-rail
20 extends horizontally and at least substantially parallel to the wall of the building in a distance below the pole when it is fully inserted with its end portion into the pipe socket.

The rack according to the present invention provides during the executing process of insertion or retrieving a resting, a guiding and a sliding support for assisting and conveniences in
25 inserting the poles into the inclined pipe sockets. The resting and sliding movement of inserting or retrieving the pole into the pipe socket according to the invention are that of the familiar seesaw on the playground.

Using the seesaw or bascule bridge from the point of view of equilibrium theory on the poles,
30 the ledge-rail provides the upward force, reduces the torque required on the carrying pole arm for the insertion. The pivoting arm holds the pole at the lower end portion that exerts a decreasing sturdy inward force and a convenient insertion of the pole into the inclined pipe socket opening.

35 According to the present invention, the rack is provided in a matching combination and arrangement with the pipe socket that achieves the best possible combination of convenience for the occupants. The support provided by the ledge rail, the obstructed space within the rack,

the reduction of weight to be maneuvered, the reduction of unbalanced torque acting on the carrier, the reduction angles of the carrier torso in bending over and the convenient usage of an inner rails improve the drying capacity, functionality and convenience for outdoor drying, thus reducing user fatigue and further enhancing safety and aesthetics.

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According to the invention, the rack preferably comprises at least one inner rail attached with its ends to the supporting arms of the rack and extending parallel to the ledge-rail, wherein a multiple of clothes hanger V-shaped rings are preferably fitted into grooves formed in the inner-rail of the rack.

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The inner rails may be provided with or without the multiple of V-shaped rings that are conveniently used to suspending clothes drying hangers and for long laundries and clothes having different size and shapes. The racks without the poles provide the supports for oversize laundries. These inner rails restrain, obstruct and avoid any tendency of slipping when bending over to insert or retrieve the pole or laundries.

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According to the present invention, various types of permanent anchoring methods for specifically designed mounting methods with different plane surfaces commonly encountered in the building industries are provided. These racks are to be economically feasible, long lasting, and structurally strong and relatively trouble free in operation.

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According to the present invention, the racks may be provided with a substantially aesthetical pleasing structural appearance and be made of a mixture configuration of materials: metals, reinforced concrete, woods and plastics together with its individual anti-corrosion protection coatings and its final finishing coatings.

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Further, the rack members may be provided with an aesthetic structure design so that all members are integral or separate mixture configurations of shapes and sizes: round, bar, open section, semi-section, tubes, flats shape and connected or associated with its adjacent elements in different manner.

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The rack according to the invention may be installed externally below the socket wall, which project horizontally, or across the sockets wall, or from above the sockets ceiling, from adjacent walls, internally and all of the above.

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Preferably, the rack is secured to the wall by embedding the end portion of its arms directly into the wall. This construction method is not fully recommended due to the difficulties

during construction, transportation, obstruction and any minor adjustment are likely not satisfactory after installation.

A better alternatively by method, according to the present invention, a mounting plate is structurally mounted by a plurality of anchorage bars or like and being embedded inside the wall during casting. Accuracy is well maintains and adjustment could be easily resolved after constructed. The remaining fabrication of the rack complete off the site and later stage installation are more appropriate and recommended in most construction.

Briefly, the pole and rack that are constructed in accordance with the principles of the present invention are essential for the effective use and admit the advantages that are not available with the prior devices. These together with other objects and advantages, which will become subsequently apparent, are treated in the detailed description, reference to the drawings throughout forming the important part of this invention.

In order to understand the object of the present invention, the detailed description of the invention set forth below is to be read in conjunction with the following drawings.

Brief Description of the Drawings

- Fig. 1: an exploded isometric view of the sockets with a designated completed assembly, the poles and partial section detail of a parapet wall;
- Fig. 2: a plan view of fig. 1;
- Fig. 3: a cross sectional view of fig. 1;
- Fig. 4: an exploded isometric view of the socket with the designated completed assembly rack and the pole;
- Fig. 5: a detail cross-sectional view of fig. 4;
- Fig. 5a: an elevation view of the mounting bracket of fig. 5;
- Fig. 6: an elevation detail of the V-shaped ring; and
- Fig. 6a: an enlarged cross sectional detail of fig. 6.

Detailed Description of Preferred Embodiment

As illustrated in figs. 1 to 3, a generally U-shaped structure rack of the invention is shown which comprises three main parts: a ledge-rail **31**, two supporting arms **32** in form of L-

shaped and an inner rail **33**. These assembled members; generally designated **30** are made of stainless steel. Fish-tail thin rectangular mounting plates **36** are made of stainless steel and are vertically orientated in a hand-free clearance distance below the pipe sockets, perpendicularly embedded and partially inside the concrete wall and protruding externally for parallel

5 attachment of the L-shaped supporting arms **32**. The mounting plates **36** have an embedded portion which is inserted with top and bottom horizontal orientated mild-steel bars **37**, welded joint **54** together and lapped into an adjacent concrete wall. External wall fascia and the mounting plates **36** are sealed by sealant **43** to absorb structural rack and thermal movements.

10 The arms **32** welded in a convenient distance from the wall are parallel with the plates **36** and welded joint **51** at all sides. The arms **32** projecting horizontally outward and inclining upward are welded to the ledge-rail **31** which extends horizontally and parallel to the concrete wall in a distance below an aluminum tube **21** of the poles **20** when fully inserted into a pipe socket **40**, without supporting the poles **20**. The top ends of arms **32** are chamfered inward

15 perpendicularly to the lower half of the ledge-rail **31** and joint-welded **52** together. The top edges of the arms **32** are rounded below the socket **40** to avoid any sharp abrasion of the human hand during the executing process.

Inner rails **33** and **34** are situated at clothes drying hanger hooked distances, and the rail **34** is

20 located between the inner rail **33** and the ledge-rail **31**. Both the rails **33** and **34** are provided in parallel to the wall and perpendicularly welded to the arms **32** upper portion and horizontally to the ledge-rail **31**. The rails **33** and **34** are sealed on its both ends and joint-welded **52**, and are inserted into the arms **32** openings **33a** and joint-welded **52** together. The rails **33** and **34** shortly protrude from the arms **32** to maximize the strength of the rail **33** and

25 stiffen the overall structure rack **30**.

As illustrated in fig. 2, the relationship of the assembled members **30** is perpendicular and parallel with the pipe sockets **40** wall. The distance from the inner wall to the ledge-rail **31** provided like an additional over-stretched arm supporting the poles **20** during their insertion

30 into the pipe sockets **40**, is within the safe distance of a similar wide casement window handle. The first or last pole **20** on the ledge-rail **31** allowing a clear pole executing process position determines the minimum length of the ledge-rail **31**. All ends of the ledge-rail **31**, the inner rails **33** and **34** are covered with stainless steel end plates and joint-welded **52** together. All types of welding joints are grinded and finally polished.

35 Regarding the above-mentioned welding joints it should be noted that these joints can be made by stud welding **50**, longitudinal-fillet welding **51**, square welding **52**, double-J welding

53 or spot-welding 54.

Figs 4 to 5a show another embodiment of the structure rack according to the invention. In this embodiment of the invention the structure rack is not embedded in the concrete wall, but is
5 mounted on the concrete wall by means of a mounting plate.

Referring now specifically to Figs. 4 - 5a, the structure rack of the present invention is constructed and mounted in conjunction with the existing sockets 40 in a concrete wall. Mounting plates in form of mounting brackets 38 with their openings 39 & 39a and the
10 "Tongue and Groove" mechanical joint slot opening 47 with chamfered edges on both sides perpendicularly connect the vertical front portion of the L-shaped supporting arms 32 and welded joint 53 together. The grind flushes to receive a backing washer 46 for the wall. The mounting brackets 38 with the rack 30 are slot fitted into the existing pipe sockets 40 and secured by stainless steel anchorage bolts and nuts 45. Tensile loading anchorage bolts and
15 nuts 45 are beside the upper portion of the arm 32 and shear loading anchorage bolt and nut 45 are below the arms 32.

The socket 40 and the brackets 38 are joint-welded 51 together and anchorage bolts and nuts are joint-welded 54 to prevent detachment. The distance between each arm 32 is structurally
20 designed to withstand any tendency of slippage when bending over to execute the insertion of the poles 30 into the sockets 40 and retrieve or hang the clothes hanger. The rest of the members shown are similar to those in Figs. 1 to 3.

As illustrated in figs. 6 and 6a, the lower end part of the rail 34 has parallel grooves 44 cut for
25 the positioning fitting for a multiple closed ends V-shaped rings 35, which are joint-welded 51 together. The rings 35 are made of stainless steel cylindrical rods, forcedly bent to a V-shape for tighter containment of the rings 25 and slots fitted into the grooves 44 that are conveniently spaced out accordingly. The lowest convoluted portions of ring 35 allow tighter containment and top upper portion wide space as provided convenient the hooking of a cloth
30 hanger's hook.

Accordingly, the racks are increased by its own ability. The foregoing has been shown, described and illustrative only of the principles of the invention. Further, since numerous modifications and changes readily will occur to those skilled in the art, it is not desired to
35 limit the invention to the exact construction and operation shown and described.

CLAIMS

1. A method for outdoor clothes drying by inserting a clothes-drying pole carrying wet washed clothes into an upwardly protruded inclined pipe socket attached in an exterior wall of a building being carried out by an occupant in a building unit, comprising the steps of:

(a) spreading wet washed clothes along said pole inside the building unit, and
(b) carrying said pole with clothes externally to allow an inner end portion of said pole to be thrust inwards into said socket,

wherein the **improvement** comprises the steps of:

(c) resting said pole on a support,
(d) sliding said pole on said support seesawing inwardly towards said socket's wall,
(e) guiding said pole into said socket's opening, and
(f) inserting inner end portion of said pole towards the inward end of said socket,

whereby said clothes-drying pole is accommodated with its inner end portion inside said socket which cantilever said pole with wet washed clothes outwardly for outdoor drying.

2. The improvement method according to claim 1, wherein said support having a slidably surface that can be attached to a designated structure so as to be at least substantially parallel to said socket's wall in a distance and at least substantially horizontally for guiding the insertion or retrieving of said pole into/from said socket.

3. A structure rack for using on an exterior wall of a building, the wall having at least one pipe socket (40) being attached beneath a window or copping of a parapet wall so as to project outwardly from the wall in an upward direction to accommodated an inner end portion of a clothes-drying pole inside said socket, therein cantilevering said pole with its washed clothes outwardly for outdoor drying, said structure rack comprising:

(a) a plurality of supporting arms which is intended to provide attachment of a support member at one end portion and to accommodate attachment to the wall at opposite end portion,

(b) said support member which is intended to provide the resting, sliding and guiding of said pole into/from said socket is a ledge-rail, wherein said ledge-rail extends at least substantially parallel and horizontally to the wall in a distance, and

(c) a plurality of mounting bracket which is intended to provide attachment of said arms and to be structurally mounted to the wall so as to support said rack,

whereby said ledge-rail providing the resting, sliding and guiding of said pole into/from said socket which cantilever said pole with wet washed clothes outwardly achieves the

convenience for the occupants for outdoors clothes drying.

4. The structure rack as according to claim 3, wherein said structure rack comprising:

5 (a) said arms is of rigid materials, of sufficient size to support said ledge-rail at one end portion and accommodate attachment to the wall at opposite end portion,

(b) said ledge-rail is of rigid materials and of sufficient size said to accommodate at least one human being normal action-reaction force when standing inside a building separate by said socket's wall,

10 (c) said mounting bracket is of rigid materials, of sufficient size said to accommodate attachment of said arms and to be structurally mounted to the wall so as to support said rack, and

(d) means for attaching said rack at integral angle to support said ledge-rail being horizontally orientated near said socket's wall at spaced location,

15 5. The structure rack according to claim 4, further including at least an inner rail for suspending clothes or likes, comprising:

(a) at least an elongated core-elements, of rigid material and of sufficient size to accommodate at least one human being normal action-reaction force when standing inside a building separate by said socket's parapet wall, and

20 (b) means for attaching said rail to said arms at least substantially perpendicular and horizontally oriented to said ledge-rail.

25 6. The structure rack according to claim 4, wherein said arms being terminated before the wall and thereof to allow to be enable means to be able exposed for attachment for said elongated element, comprising:

(a) said elongated elements is of rigid material, of sufficient size to accommodate one portion inside the wall and opposite portion exposed to accommodate one end of said arms so as to structurally support said rack,

30 (b) said mounting element of sufficient size to accommodate one portion of said elongated elements inside the wall, and

(c) means for attaching adjacently or parallels on one of its portion to said arms, whereby said one portion of said elongated elements embedded inside in the wall structurally and opposite portion of said elongated elements to be exposed for parallel attachment of said arms, thereof providing structural support for said rack.

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7. The structure rack according to claims 4 or 5, wherein said structure rack comprising:

(a) said arms is made of metal, of an elongated plate shape, has a further increasing in its spatial complexity, of sufficient size and includes means for joining comprises ends, wherein each end comprises joins means attachment to the wall and said ledge-rail,

5 (b) said ledge-rail is made of metal, of an elongated cylindrical shape, has a further increasing in its spatial complexity, of sufficient size, includes means for joining said arms at respective portion and a slidably surface for said pole,

(c) said mounting brackets, is made of metal, an elongated plate shape, has a further increasing in its spatial complexity, of sufficient size, includes means for joining said supporting arm at its surface and attachment mean structurally connected to the wall for
10 supporting said rack, and

(d) said inner rail is made of metal, of an elongated cylindrical shape, has a further increasing in its spatial complexity, of sufficient size, includes means for insertion and attachment to said arms at respective portion.

15 8. The structure rack according to claim 7, wherein said structure rack comprising:

(a) said arm (32), wherein said metal is steel plate, of L- shaped, vertically and perpendicularly orientated to the wall, situated below said sockets (40), one of its end portion of said arms (32) being broadest so as to enable to attach to said bracket (38), beyond mounting end portion of said arms (32) which project outwardly, inclining upward to top ends
20 of said arms (32) and chamfered inward perpendicularly to lower half portion of said ledge-rail (31) for attachment, mounting end portion being broadest of arms (32) is perpendicularly attach to center of said bracket (38) for mounting to said socket's (40) wall, the bottom mounting end portion of said arms (32) is acclivity upwards, agonic turn and chamfered inward towards lower half portion of said ledge-rail (31), wherein said arms (32) including an
25 extends through openings (32a), below edge of horizontal outward vertical surface of said arms (32) is for insertion of said rail (33), within said rail (33) being parallel and horizontally orientated to said ledge-rail (31) and perpendicularly to said arms (32), further said rail (33) being place in-between the wall and said ledge-rail (31),

(b) said ledge-rail (31), wherein said metal is steel, of cylindrical uniform cross-section
30 pipe, having both ends sealed, said ledge-rail (31) are parallel and horizontally to said socket's (40) wall, said ledge-rail (31) are remote to the wall and remote below inserted said pole (40), the minimum distance of said ledge-rail (31) is determined by the first and last of said poles (20) with sufficient distance to maneuvered said pole (20) into said socket's (40) opening,

(c) said bracket (38), wherein said metal is steel plate of rectangular shaped, said
35 bracket (38) rectangular facial central portion is for attachment for said arms (32), an opening (39) formed matching to the outer diameter of said socket (40), and where said socket (40) extends through the opening (39), both vertical sides and bottom portion of said arms (32)

having an openings (39a) formed with matching anchorage bolts (45) size so as to structurally support said rack (30), and

(d) said inner rail (33), wherein said metal is steel, of cylindrical uniform cross-section pipe, having both ends sealed, horizontally and being substantially parallel orientated to said ledge-rail (31), remote below inserted said pole (20), said rail (33) inserted perpendicularly into vertical surface of said arms (32) with a short protrusion and form to said arms (32), further said arm's opening (32a) is for insertion of said rail (33), thereof said rails (33) is being situated conveniently for suspending clothes or hangers from inside the building.

9. The structure rack according to claim 8, further including a multiple of V-shaped ring (35) incorporated into said rail (33) for suspending clothes hangers being carried out by an occupant in a building for outdoor clothe drying comprising:

(a) a multiple of agonic bent core-elements of rigid material of sufficient size to accommodate hooking of clothes hangers and conveniently spaced apart, and

(b) means for attaching one portion of the core-element to said rail (33) outer surface.

10. The structure rack according to claim 9, wherein said V-shaped rings (35) is made of metal, of cylindrical uniform shape, has a further increasing in its spatial complexity and of sufficient size, wherein said rings (35) is form to a V-shaped, both closed ends portion bent so as to enable to attach to said rail (33), attach mean slot fitted into a grooves (44) and form together with lower half portion of said rail (33) so as to being parallelism to said rail (33).