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FOLDABLE CLOTHES-DRYING RACK CUM SUN-SHADING DEVICE

Field of the Invention

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This invention in general relates to an improved foldable clothes-drying rack cum sun-shading device, generally mounted indoor in a building, possesses structural supports of a plurality of mounting brackets for articulated a plurality of elongated supporting arms with a plurality of transversal poles in a foldable manner, thereto supporting the rack at least substantially

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horizontal or fold externally beyond an external parapet wall for drying.

The rack further including outward guiding or telescopically function for an elongated tube from inside the pole, the pole assembly is interposed inserted into sequentially openings of the arms for outdoors drying. The rack mounted at convenience height for the occupants, the retraction of the tube with multiple securing features for securing the pole assemblies for suspending laundries that are carryout indoors, whereby contributed to the safety and aesthetics of this invention.

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Description of Related Art

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The execution of outdoor/indoor clothes drying varies with each individual occupant practice, the physical height of the carrier and the weight of the wet laundries on a clothes-drying pole to be maneuvered and the type of clothes-drying device use.

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Mounted clothes drying devices are widely use, outdoor device such as a short pipe socket device; being partially embedded inside an external parapet wall, thereto allowing a short end portion of the clothes-drying pole to be inserted into the pipe socket device so as to cantilevered the pole outwardly in an upward direction for drying wet washed laundries. Another known device; the clothes-drying pole placed onto a both ends tool design support rack, thereby supporting the poles with laundries on both of its ends for drying in buildings.

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Indoors mounted clothes drying devices are generally use, such as wall/ceiling mounted retractable racks, clotheslines, self-standing racks and others. The entire above prior art are created to assists, convenience the occupant for outdoor/indoor laundries drying in a building and are described in US 5219080, US 4029211, US 03920127, CN 2333738, GB 2305853, JP 08175495, JP 09110501, JP 07000850, JP 09327593, JP 10143696, US 5971170, EP 916297, JP 9327597 and US 3712556.

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Commercially available foldable laundry wall hangers, at first appearance have similarities with the present invention, there are of differ in structural, functions and distinctly does not support outward protrusion of an elongated tube for outdoor drying in a building. These differences, which will be described in more detail hereinafter, are essential for the effective use of the invention and admit of the advantages that are not available with the prior art.

These foldable wall hangers generally of a U-shaped, mounted indoor, consisting of a plurality of transversal poles that are either interposed inserted or snap into a pair of arms and drying of laundries is assumes between the arms, the arms are articulated adjacently to an upper top portion of a mounting bracket in a foldable manner, and diagonally supported by its adjustable struts or telescopic braces from the lowest bottom portion of the bracket to a horizontal oriented position.

Conventional rotational fastening devices that facilitated frictional clamping of the telescopically extendable elongated tube to a desirable length have been known. Pole or tube-fastening devices that are rotationally driven and facilitated clamping of the pole onto the tube or vice-versa to a length for their purpose are commercial known.

Resilient control-pin device (also known as ball-locking bolt in multi-industries) is assumes and developed to provide rotationally indexed (ball-locking) engagement of the pole to an opening into a notch of the arms and for use in this instant invention.

These rotational fastening devices that rotationally immobilized or engaged will be described in more detail hereinafter, are essential for the effective use of the invention and admit of the combined advantages that are not available with the prior art.

Summary of Invention

It is a main objective of the present invention to provide an improved foldable clothes-drying rack, generally mounted indoors in a building for laundries drying, the rack is improved in its supports and provides with the best possible convenience and functionality for the occupants. It should be attractive in appearance, desirable to current manufacturing process and according be manufacture from various materials.

According, the rack is of U-shaped that folds at least substantially horizontally and being parallelism to the external of the building in a distance above coping of the parapet wall comprises of a matching interlocking construction having a plurality of mounting brackets

supporting a plurality of elongated supporting arms, wherein the arms is articulated in a foldable manner, and thereof to be slidably retain by an inclined spring loaded snap-pin devices. The snap-pins is slip fit within an inclined bore of an elongated housing member of the bracket and a compression spring resiliently extend to slide into an inclined mating passage of the arm thereto supporting the rack.

Furthermore, the arm after the matching interlocking construction with the bracket includes sequentially thru openings for interposed insertion of a plurality of transversal poles. At least one pole are inserted with a resilient control pins device on one end or on both ends to at least one number of the pole, whereby the interposed inserted pole with the control-pin device confidently secure to a notch of the opening of the arm preventing inadvertent dislodgement.

The arm after the interlocking construction with the bracket is of a **I** –shaped cross-section shaped, the longer edges being vertically oriented, has a further increasing in its spatial complexity, and whereby the thinning of internal thickness of the arms reduces the weight contributed to a lighter and rigidified the folding operations.

According, the control-pin device enable rotationally indexed engagement into the notch within an opening of the arm thereby structurally rigidified the arms, increases the structural strength of the overall rack and further rigidified the operations of the rack at any positions. The rack with the control-pin device realizes the advantage to fold either upward or downward structurally that is not available in related prior art.

It is an additional objective of the present invention to provide the bracket's construction that is suitable for use in many positions to secure the arms with its interposed inserted poles, capable of folding the rack beyond an external parapet wall for outdoor drying. Ideally the brackets articulated method for securing the arms in a foldable manner should provide an attachment plane that's permits various positions and also use as a sun-shading device.

Furthermore, according to another aspect of the present invention, the rack further includes an elongated tube inserted into the pole, the inserted tube secured by a plurality of rotationally driven fastening devices and the control-pin device that secured this pole assembly to the notch of the arm's opening. The multi-securing features abilities for secure the tube telescopically to a desirable length beyond an external parapet wall for outdoors drying.

According, the rack for retracting/drawing-out of the tube from the pole generally mounted adjacently to an external wall, above the top level of parapet wall with sufficient clearance,

thereof enhances safety measures standards and improved in its carrying abilities for outdoor drying.

The pole inserted with the control-pin devices into one end portion for rotationally indexed engagement into the notches of the arm's openings that enable the tube to be guided outwardly beyond a parapet wall for drying. It should be understood that the rack with its multiple secured feature abilities securing the pole assemblies, hardly dislodgable even in windy weather conditions in a building, and which admits of the advantages that are not available with the prior art.

It is the principal objective to the present invention, the poles being made of aluminium alloy or even stainless steel, extruded in cylindrical cross-section shaped in a single void construction, an internal diameter of not less than 26.5mm that enable the retraction of the tube having an outer diameter of 25.4mm, the tubes are also made of aluminium alloy, extruded in cylindrical cross-section shaped in one single void construction, the external surface having uniform elliptical shaped for increasing the overall structural strength capacity, light in weight.

The pole characteristics are essential for the effective use and its abilities of this invention comprising the following:

- (a) slidably movements within longitudinal length of the tube inside of the pole,
- (b) anti-clockwise rotationally frictional fastening of the tube-fastening device from the tube to the pole,
- (c) rotationally indexed engagement into the notch by the control-pin devices within at least one ends portion of the pole,
- (d) stability and rigidity of the overall rack by the first transversal pole of the rack having both end portion with the control-pin devices,
- (e) limitation protrusion of the tube by a mechanical inwards force indentation on the circular wall of the pole, and
- (f) prevention of any inadvertent dislodging by an rotationally anti-clockwise pole-fastening device,

whereby the pole is provided in a matching combination, arrangement and its multiple secured features that confidentially securing the pole assemblies to the arms thereof achieves the best possible combination of convenience and safety for the occupants.

According to the present invention, the rack provides by its supporting and guiding function, thereby enhance the safety standards for outdoor drying that achieves the best possible combination of convenience for the occupants. While the advantages of the invention are fully

realized by the rack abilities, comprising the following:

- (a) reverse abilities to fold the rack as close to the wall as possible by reversing the mounting brackets,
 - (b) folding the arm with the poles that extend outwardly above an external parapet wall and maintains its internal mounting construction,
 - (c) installing the rack at convenience level for the spreading or removing of laundries,
 - (d) interlocking the arms structurally into the brackets by the spring loaded snap-pin devices,
 - (e) rigidified the folding movements by the first transversal pole of the rack having control-pin device on both of its end portions,
 - (f) reversible orientation of the pole assemblies to direct the tube either outwardly or inwardly, and
 - (g) quickly release the pole assemblies for the insertion or removing of laundries by a push-button of the control-pin device,
- whereby the rack supporting the poles realizes some of the advantages that are increase by its own abilities.

Furthermore, according to another aspect of the present invention, the rack for use as a sun-shading device (not shown) are constructed in accordance with the principles of the rack, generally mounted internally above an opening, and thereto enable supporting of the arm to pivotally fold outwardly for blocking the sun direct radiation. The resilient mating insertion of the snap-pin device is incorporated into the one portion of arm that enables quick release of the ring or a locking fastener (not shown) for disengaging from the bracket. The arms supporting the interposed poles at closer spacing and for use as a sun-shading device for blocking sun direct radiation and glare.

Further 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.

Briefly, the racks 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

- 5 FIG. 1: an isometric view of an improved foldable clothes-drying rack mounted internally
 in a building at matching interlocking position for outdoor drying;
- FIG. 2: a cross-sectional view of a mounting bracket engaging with a supporting arm
 at matching interlock construction position as of FIG. 1;
- 10 FIG. 3: an enlarge cross-sectional view of the arm at folded position and during
 engagement of a spring loaded snap-pin device into an inclined passage
 of the bracket as of FIG. 2;
- FIG. 4: an isometric view of another aspect of the rack mounted internally in a building
 and a partial section of a parapet wall;
- 15 FIG. 5: an enlarge cross-sectional view of the bracket engaging with the arm at matching
 interlocking position as of FIG. 4;
- FIG. 6a: a top view of FIG. 5;
- FIG. 6b: a bottom view of FIG. 5;
- FIG. 7a: a cross-sectional view of the arm before engaging with the bracket at vertical
 oriented foldable position;
- 20 FIG. 7b: a cross-sectional view of FIG. 7a;
- FIG. 8: an isometric view of the rack with a plurality of transversal poles supporting a
 plurality of elongated tubes;
- FIG. 9: a plan view of FIG. 8 at horizontal orientated position and at folded position;
- 25 FIG.10a: a enlarge cross sectional view showing a rotationally indexed resilient control-
 pin device engagement in a notch of the arm's opening in their operative position;
- FIG.10b: a cross-sectional view showing a rotationally anti-clockwise tube-fastening
 device and the pole in their operative position;
- FIG.10c: a cross-section view of the tube-fastening device terminated before a mechanical
 inward force indention on the wall of the pole;
- 30 FIG.10d: a cross-sectional view of a rotationally pole-fastening device;
- FIG.10e: a cross-sectional view of the pole on the arm's opening;
- FIG.10f: a cross-sectional view of an end stopper of the pole;
- FIG.11a: another cross-sectional view of the control-pin device during disengagement of
 the pole from the notch of the arm in horizontal orientation position;
- 35 FIG.11b: an enlarged cross-sectional view of FIG. 10b;
- FIG.11c: an enlarged cross-sectional view of FIG. 10c;

Detailed Description of Preferred Embodiment

The invention is particularly applicable to the otherwise conventional indoor mounted foldable clothes-drying rack for used in a building, and the invention will be described with reference to this application with the conventional rotationally fastening devices of a telescopically extendable elongated tube inserted into an extruded aluminium transversal pole.

As illustrated in FIGS. 1 - 3, a generally **Π**-shaped clothes-drying rack in operation position, generally mounted indoors in an exterior parapet wall of the building so as to fold externally beyond the parapet wall in an upward direction for outdoor drying. The rack folds at least substantially horizontal, being parallelism to the external of the building in a distance above coping of the parapet wall and the rack comprises of three main parts: a plurality of mounting brackets **50** in the form of **Γ**-shaped, a plurality of elongated supporting arms **70** and a plurality of transversal poles **21a** & **21b** inserted into a plurality of openings **72** of the arms **70**.

The bracket **50** is made of stainless steel and comprises of a thin rectangular flat mounting plate **51** being vertically oriented for mounting to any structure surface and an elongated **U**-housing **52** attached to upper top portion of the plate **51**, the upright legs of the housing **52** includes a thru opening **56** for attachment of a pivotably-dowel **57** near the interfacing of the plate **51** and housing **52**. The plate **51** includes a plurality of thru openings **54a** on its facial for a plurality of matching anchorage bolts **54** for structurally mounting to any surface.

The supporting arm **70** is made of stainless steel and comprises of an oblate-portion **74** at one of its end of an arm **71** for a matching construction plane to upright portion of the housing **52**. Within oblate-portion **74** include a plurality of snap-pin device **60**. Forward end **71a** portion of the arm **71** is inserted in a matching manner into a frustrum portion between legs of the housing **52** and articulated by the pivotably-dowel **57** in a foldable manner matching the thru openings **56** to be slidably retain by the snap-pin device **60** within a inclined bore **55** of the housing **52** of the bracket **50**.

The upright legs of the housing **52** after the pivotably-dowel **57** insertions is incurvate downwardly to provide a matching marge construction with the oblate-portion **74** of the arm, thereby maintain as a compact elongated construction of the present invention. The frustrum portion within the legs of the housing **52** are for the matching marge construction in a foldable manner further included an inclined housing **76** for an second inclined spring loaded snap-pin device **80** incorporated within the oblate-portion **74** of the forward end arm **71a**.

The remaining portion **71b** to **71c** after the oblate-portion **74** of the arm **71** is elongated

rectangular of **I**-shaped cross-section shaped; the remaining portion **71b to 71c** includes a plurality of thru sequentially openings **72** for interposed insertions of the pole. The openings **72** include a convoluted circumference wall **72a** in a mating central passage into a notch **73** for a plurality of balls **49** of a resilient control-pin device **40** that facilitated a rotationally indexed engagement. The opposite end **71c** portion of the arm **71** is in close-end web construction.

The poles **21a** for insertion into the sequentially openings **72** of the arm **71** being at least substantially the same length of the spaced located arm are provided with a pointed arch end-stoppers of polymer material to both of its ends. The first transversal pole **21b** of the rack is provided with the control-pin devices **40** to both of its end that structurally rigidified the overall rack for ease of operation.

The poles **21, 21a, 21b & 21c** as according to the present invention is made of aluminium alloy, extruded in cylindrical cross-section shaped in a single void construction with uniform convoluted permanent-mold cast on its external periphery surface along its entire length, a constancy wall thickness of about 0.75mm and an internal diameter of about 26.5mm.

Another aspect of the present invention as accordingly to FIGS. 1 - 3, the rack assumes as a sun-shading device (not shown) is reverse mounted internally above an opening of an external wall, at least substantially horizontal, being parallelism to the external wall of the building, in a distance from the wall and assumes suspending of clothes hanger or likes for outdoor drying. The rings **62** for disengaging the snap-pin devices **60 & 80** from the bracket **50** is either maintains or replaced by a lockable fastener (not shown) incorporated into the snap-pin devices **60 & 80**.

As illustrated in FIGS. 4 to 7b, the rack as according to the present invention has similarities to commercially available foldable laundry wall hangers, but of differences in its structure characteristics supporting the arms **70**. The improved rack is generally mounted indoors in the building of the invention is shown as according to the foregoing construction principles which comprises of the three main parts: the plurality of mounting brackets **50a** in form of **└**-shaped, the plurality of supporting arms **70a** and the plurality of transversal poles **21 & 21b** inserted into the sequentially of thru openings **72** in the middle portion of the arm **71** of the supporting arms **70a**.

The arm **71** is articulated by the pivotably-dowel **57** in a foldable manner and slidably retain by the inclined mating insertion construction of the first inclined spring loaded snap-pin device **60a**, preferably of one hundred and seventeen degrees (117°) from the pivotably-dowel **57**

horizontal plane, and inserted inside the inclined bore **55a** incorporated within end portion of an elongated **Π**-shaped housing member **52a** of the bracket **50a**.

5 In FIGS. 5 & 7a, the bracket **50a** comprising of a thin rectangular mounting plate **51a** being vertically orientated for perpendicularly facial attachment to the horizontal oriented housing **52a** at its upper middle facial portion. The plate **51a** includes the plurality of thru openings **54a** on its facial for the plurality of matching anchorage bolts **54** for structurally mounting to any surface.

10 In FIG. 7a, the lower half portion of the member **52a** legs near the interfacing of the plate **51a** include a thru openings **56** for insertion of the mechanical jointed pivotably-dowel **57**. The end **71a** portion of the oblate-portion **74a** of the arm **71** includes a thru opening for matching mounting and insertion of the pivotably-dowel **57** and allowing the arm **71** to fold as close as possible to any mounting structure.

15 The frustrum portion within the legs of the housing **52a** are for the insertion in a foldable manner by the inclined second spring loaded snap-pin device **80** incorporated within the oblate-portion **74a** of the forward end arm **71a** inside an inclined holder **76**, preferably of fifty-six degrees (56°) from the pivotably-dowel **57** horizontal planes. The sole of the legs of the housing **52a** after the pivotably-dowel **57** insertions is incurvate upwardly to provide a matching marge with the remaining portion **71b to 71c** of the arm, thereby maintain as a compact elongated construction of the present invention.

20 The snap-pin devices **60a & 80** as illustrated in FIGS. 5 & 7b, comprising of the dowels **61 & 61a** of a circular cross-section shaped, one end portion has a U-shaped tip to provide slidably surface and smooth penetration into an inclined mating insertion passages **77a** or **53a** of the oblate-portion **74a** or a socket **53** of the plate **51a** and prevents avulsion of the arm **71** when inserted.

30 The middle longitudinal portion to opposite end portion of the dowels **61 & 61a** is shrink to a smaller circular diameter; the shrink portion is a shank. The shank of the dowels **61 & 61a** enable insertion of a metal compression spring **64** and maintains within a slidably movement in an inclined bores **55a & 75**. The end of the shank penetrated into their respective matching thru opening eyelets **63 & 63a** and containing the snap-pin devices **60a & 80** within the bores **55a & 75**.

35 The end portion of the shank includes an eyelet for the insertion of a ring **62** to facilitate the

withdrawing and for disengagement of the arm **71** from the bracket **50a**. The top portion of the eyelet **63** includes a longitudinal recess **65** to house circular surfaces of the salient ring **62**, thereto containing the dowel **61** at withdrawn position.

5 In FIGS. 7a & 7b, within the oblate-portion **74a** from the end **71a** portion to the end **71b** portion, further include the second snap-pin device **80** for securing the arm **71** to storage or kept position. The holder **76** for the second snap-pin device **80** incorporated into the oblate-portion **74a** of the arm **71** are chamfered inwards and maintain a clear spacing from the legs and frustrum portion of the housing **52a**.

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The eyelet **63a** on top of holder **76** includes a parallel recess **66** maintaining the ring **62** at a salient position without obstructing the leg's sole of the housing **52** during folding operation. Within the first inclined snap-pin device **60a** and the position of the second snap-pin device **80** include a bracket-opening **58** on the housing **52a**. The bracket-openings **58** are for the
15 interposed insertion of the pole **21** and at its middle portion of the bracket-opening **58** include a notch **58a**.

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As shown in FIGS. 6a, 6b & 7b, the arms **71** extend horizontally and perpendicularly to the mounting bracket **51a** with the oblate-portion **74a** in substantially parallelism matching
20 engagement with the housing **52a**. The end **71b** portion of the oblate-portion **74a** is acclivity upwards in a matching inclined plane with the first inclined snap-pin device **60a**. The end portion of the housing **52a** includes a pair of leg's wall protruded acclivity front wings **59**. The wings **59** are chamfered upwardly provide guiding and lateral resistant movement for the arm **71** after its mating engagement position with the housing **52a**.

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As illustrated in FIG. 7a, the position of the pivotably-dowel **57**, the rotational folding of the arm **71**, the tip of the snap-pin **61a** from the matching passage **75** into the passage **53a** determined the socket **53** position on the vertical mounting plates **51a**.

30 Remaining portion **71b** to **71c** of the arm **71** after its inclined mating attachment with the housing **52a** is of **I**-shaped cross-section for material saving and minimizes the weight for ease of operation. The openings **72** include a convoluted circumference wall **72a** in a mating central passage into the annular notch **73** for rotationally indexed engagement of the control-pin device **40**.

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Referring now to FIGS. 8 to 11c, the rack is constructed as according to the foregoing mention principles, mounted adjacently indoor to an external parapet wall to direct an elongated tube **34**

from the internal void of the pole **21c**, the tube **34** telescopically extend outwardly for outdoor clothes drying is made of aluminium alloy, extruded in cylindrical cross-section shaped in a single void with permanent-mold cast with a plurality of uniform corrugated elliptical shaped along its entire extend, a constancy wall thickness of about 1mm and an outer diameter of about 25.4mm.

One ends **25** portion of the pole **21c** is provided with the control-pin device **40** and the opposite ends **25a** include a pole-fastening device **26** to facilitated rotationally frictional clamping onto the tube **34**. Further, the inserted ends **23** of the tube **34** into the pole **21c** include a force inserted rotationally clockwise of the tube-fastening device **35**.

As shown in FIGS. 9, 10b, 10c, 11b & 11c, the tube-fastening device **35** is rotationally fastening anti-clockwise into the internal slidably surface of the pole **21c** in the operative position, the remaining longitudinal drawing out length of the tube **34** extend thru the pole-fastening device **26** into the opening **72** of the opposite arm **71**.

It should be noted that the anti-clockwise fastening of the tube-fastening device **35** and the clockwise fastening of the pole-fastening device **26** increase its magnitude of fastening the tube **34** of the pole assembly **20**.

In FIGS. 11b & 11c, the tube-fastening device **35** made of polymer material comprising of a coupling **36** having changes at its forward end **36a** portion to include a recess cylindrical housing **38** for the insertion of a resilient circular-locking element **37**. The opposite end having a matching outer periphery surface for force inserting into inter periphery of the end portion of the tube **34** preferably about 15mm. The housing **38** has one section thicken **38a** in its surface to a mating tapered frictional pressing with a thicken-section **37a** of the circular-locking element **37**.

The rotation of the tube **34** that facilitated a centripetal force with the force inserted coupling **36** towards the thicken-section **37a** of the locking element **37**, thereto create an outward radial force acting on the thicken-section **37a** that rotationally immobilized and frictionally hold the tube **34** to the pole **21c**. The centrally passage is void to minimize to weight of the tube fastening device **35**.

In FIGS 9 & 10c, a short length preferably about 200mm before the pole-fastening device **26** includes a mechanical inwards force indentation **39** on the wall of the pole **21c** for terminate the drawing-out of the tube **34**. An outer periphery **36b** of the coupling **36** having a wider

circumference as compare to the internal's ridge of the indentation **39**, thereby at its interfacing with a ridge of the indentation **39** and end **23** portion of the tube **34** facilitated limitation containment of the tube **34** within the pole **21c**.

5 The pole-fastening device **26** as illustrated in FIG. 10d, comprising of an annular locking taper sleeve **27** preferably a length about 80mm and has a cylindrical cross-section shaped stationary clamp **30** having thread portion on the outer periphery that enable engagement into an inner periphery threaded **29** of the sleeve **27**. The clamp **30** inserted into end portion of the tube **34** includes breakages on its threaded portion for resilient receiving of the thread **29**.

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The clamp **30** further includes a plurality of extended elongated leg **31** from collar **30a** portion of the clamp **30**. At its forward end of the leg **31** include a foot **32** having a thick sole for pressure clamping into the tube **34** from a plurality of matching cavities **33** on the cylindrical wall of one end **25a** portion of the pole **21c**.

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As illustrated in FIG. 10d, the pole-fastening device **26** in their relative engagement positions of the clamp **30** at the end **25a** portion of the pole **21c** and the threaded **29** about to engage collar **30a** portion of the clamp's **30** in a clockwise rotationally manner. The sleeve **27** has a forward end mouth **27a** to accept the clamp **30** and at the other end a reduce diameter mouth **27b** slidably matching diameter to the outer-surface of the tube **34**. In this annular passage of the sleeve **27**, include the threaded-portion **29** near the mouth **27a** for rotational engagement into a threaded portion of the clamp **30**, at its middle portion of the annular passage has a mating tapered section **28**, preferably inclined about eight degrees (8°) to facilitated rotational pressure detent on top portion of the foot **31**, thereto frictional clamping the tube **34** by the tapered section **28**.

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The control-pin device **40** as illustrated in FIG. 10a, comprising of four main parts: a cylindrical cross-section polymer stationary holder **42** for insertion into one end **25** portion of the pole **21c**, a pointed arch push-button **41** made of polymer material with a mould-cast hexagonal metal nut **41b** incorporated into one end **41c** portion, a metal shaft **43** having a threaded **43a** portion at forward end and a head **46** on the opposite end, a metal compression spring **44** inserted into the shaft **43** and captured inside a spring-housing **44a** and a plurality of metal balls **49** force matching inserted into a plurality of ball **49** size-matching openings **48** of the holder **42**, the openings **48** is radiated perpendicularly from the center of shaft **43**.

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The head **46** of the shaft **43** has two plane of circular cross-section of a matching outer-surface urging the balls **49** into a locking position or a reduced circular cross-section plane **45** for

disengagement the urging of the balls **49**. The forward end of the holder **42** comprises of a push-button recess **41d** for the push-button **41**, a spring-housing **44a** to contain the spring **44** and a matching thru opening **43b** for the shaft **43** at its centrally passage. Further, a centrally passage recess **45a** for the shaft's head **46** & **45** include the openings **48** that are radiated
5 perpendicularly from the center of shaft **43** for the balls **49**.

In operative or buck position of the control-pin device **40** as shown in FIG. 10a, the balls **49** protruding from the openings **48** of the holder **42**, and penetrated into a smaller diameter as compare to the size of the ball **49** in a matching thru openings **47** on the wall's of the pole **21c**.
10 The spring **44** is supplied to resiliently extend within the spring-housing **44a**, which directs the head **46** inwardly into the holder **42** that imparts a radial torque from the outer-surface of the head **46** into the protruding balls **49**, thereto urging the balls **49** rotationally indexed to the notch **73**.

15 In disengagement position of the control-pin device **40** as shown in FIG. 11a, the push-button **41** compressed that is limit by a collar **41a** and the recess **41d**, the spring **44** is fully compressed and readily capture in the recess in the spring-housing **44a**. The balls **49** relaxed or released from the radial imparts torque of the head **46** and move freely within the plane **45**, whereby the balls **49** continues to rotate freely within the openings **48**, disengaging the rotational indexed
20 between the balls **49** and the convoluted recess of the notch **73**.

Accordingly, the versatility and usefulness of the rack and pole assemblies are increase by its own ability. Since numerous modifications and changes readily will occur to those skilled in the art, it is not desired to limit the present invention to the exact construction and operation shown
25 and described.

Furthermore, the present invention has been described with reference to the illustrated and presently preferred embodiment. It is not intended that the invention be unduly limited by this disclosure of the preferred embodiment. Instead, it is intended that the invention be defined by
30 their means and obvious equivalents.

CLAIMS

1. A foldable clothes-drying rack generally mounted indoor in a building, initially in a vertical position and is fold outwardly to an indeterminate final horizontal position to
5 accommodate use by a human being for suspending laundries or likes for drying, comprising:

(a) a plurality of supporting arm of sufficient size comprising; a end portion of said arm is exposed for attachment to provide articulation for said arm, a forward end portion of said arm is for containment and a remaining portion of said arm to provide suspension of laundries for drying,

10 (b) a plurality of elongated housing of sufficient size has a frustrum for receiving said end portion of said arm to provide pivotably mounting for articulation of said arm into said housing, opposed side walls and a top defining passage, said top and side walls adjoining to a front portion of said arm in a matching marge construction to provide containment for said arm, further said housing include a base therein for mounting said housing to any surface to secure
15 said rack, and

(c) containment means said front portion of said arm extending there through of a size and shape sufficient to articulate adjacently said arm into said frustrum of said housing.

2. The rack as according to Claim 1, further including a plurality of transversal pole that
20 is integral attach to said remain portion of said arm for suspending laundries.

3. The rack as according to Claim 1 wherein said arm includes a plurality of opening incorporated into said arm to provide support for said pole, therein said opening is sequentially spacing for insertion of said pole into said opening at both of its end portion.

25 4. The rack as according to Claim 1 wherein said housing to any surface is coping of a parapet wall or likes to secure said rack.

30 5. The rack as according to Claims 1 & 4, wherein said housing includes a mounting plate that is integral to said housing, said plate is of sufficient size to provide for mounting said rack to any surface.

35 6. The rack as according to Claim 3 wherein said opening includes a convoluted recess that is integral to convoluted circumference wall of said opening in a mating central passage therein for receiving said pole when inserted.

7. The rack as according to Claim 6, further including a control-pin device, comprising:

(a) a plurality of ball is of sufficient size to accommodate rotationally indexed engagement to said notch of said opening of said arm,

(b) a shaft is of sufficient size has a head of two circular cross-section plane to accommodate axially slidably of said balls, within said balls in operative position is seated in a forward end portion of said head, said head having a wider circumference that imparts a radial torque forcing said balls outwardly indexed into said notch of said opening of said arm, and in a disengagement position said ball rotationally relaxed in the second circumference of said head, further said on opposite end portion of said shaft includes a threaded portion for rotationally fastening,

(c) a push-button is of sufficient size to accommodate use by a human being for urging disengagement from said engagement of said ball from said notch, said push-button is incorporated at end portion of said pole for rotationally fastening of said threaded portion of said shaft, and

(d) a stationary holder is of sufficient size to accommodate insertion to one end portion of said pole and includes a centrally passage housing for said shaft, a recess for said push-button and a housing for axially radiated said balls,

whereby said control-pin device allow rotational movement of said ball inside of said notch of said arm that prevent collapse of said arm, therein rigidified overall said rack thus stabilize operation process.

8. The rack as according to Claim 7, further including a compression spring is of sufficient size to provide a limited degree of resilient force for use by a human being's hand, said force is supplied to resiliently extend to said head outwardly to relaxed said balls from said engagement from said notch, further said spring resilient urge to its buck position into said engagement position after removable of said force,

whereby said spring maintain a resilient force to engaged said ball into said notch and allow a quick release or insertion method for said control-pin device that contribute to easy of operation.

9. The rack as according to Claim 8, further including an elongated tube of substantially matching size to internal periphery of said pole so as enable slidably mating insertion into said pole with a limited degree of frictional pressing restriction movement during extending or retracting being carried out by a human being.

10. The rack as according to Claim 9, further including a tube-fastening device for engagement one portion of said pole into said tube, comprising of a plurality of rigid parts that can be attached to end (23) portion of said tube for interlocking into said pole thereto preventing

inadvertent dislodgement.

11. The rack as according to Claim 10, wherein said tube-fastening device (35) force inserted into one end portion of said tube for extending outwardly, comprising:

5 (a) a resilient circular-locking element (37) is of polymer material of sufficient size to accommodate within slidably internal surface of said pole, further said circular-locking element is of circular shape having a thickness, a inward thicken portion (37a) at one end portion, a outer diameter substantially wider than said pole with a break portion whereby facilitated a compressed inward material resilient strength, and

10 (b) a coupling (36) is of polymer material of sufficient size to provide insertion into one end portion of said tube and enable nutate movement within slidably longitudinal length said pole, within said coupling-socket include a recess cylindrical housing (38) at forward end and a thicken-section (38a), thereby facilitated outwardly rotational frictional pressing for said thicken portion (37a) of said circular-locking element (37),

15 whereby said coupling is driven in rotation by said tube with stationary position of said pole until said thicken-section of said circular-locking element interlock frictionally with said thicken-section of said circular-locking element, further said circular-locking element is rotationally immobilized during the run up of said tube that facilitated outwardly frictional pressing engagement.

20 12. The rack as according to Claims 9 to 11, further including a pole-fastening device (26) comprising of a plurality of rigid parts that can be attached to outer periphery of said pole for interlocking into said tube (34) thereto preventing inadvertent dislodgement.

25 13. The rack as according to Claims 11 & 12, wherein said pole-fastening device (26) comprising:

30 (a) a sleeve (27) of polymer material of sufficient size to accommodate use by a human being rotationally engagement for clamping from said pole onto said tube, said sleeve having a mouth at forward (27a) portion, a threaded portion (29) for engaging and a reduce diameter mouth (27b) matching to slidably outer periphery of said tube, and

35 (b) a stationary clamp (30) of polymer material of sufficient size to accommodate insertion into one end (25a) portion of outer periphery of said pole and a threaded portion on outer periphery to accommodate rotationally engagement of said sleeve, further end (25a) portion of said pole includes a plurality of matching cavities (33) for a plurality of extended elongated legs (31) from collar (30a) portion of said clamp, said leg include a foot (32) having a thick sole to accommodate within cavities of said pole, thereto facilitated pressure clamping of said pole onto said tube,

whereby said pole-fastening devices that facilitated inwardly frictional clamping engagement of said pole onto outer periphery of said tube.

14. The rack as according to Claim 11, further including an inwards force indentation (39) into circular wall of short end portion of said pole thereto provide a ridge between said socket's outer periphery (36b) edges and end (23) portion of said tube,

whereby said ridge provide limitation protrusion of said tube from internal periphery of said pole thereto preventing inadvertent dislodgement.

15. The rack as according to Claim 1, further including a snap-pin device comprising:

(a) said snap-pin device comprising of a rigid part that can be adapted into said front portion of said arm to move between a first position wherein said snap-pin device is engaged with said housing and a second position wherein said snap-pin device is disengaging from said housing being accommodate for use by a human being, and

(b) retain means preventing said arm from avulsion when engaged,

whereby said snap-pin device is applicable for reverse adaptations, therein adapted into said housing to be slidably retained into a passage of said arm when engaged.

16. The rack as according to Claim 15, wherein said rigid part is a dowel having two end portions.

17. The rack as according to Claim 16, wherein said dowel includes a ring adapted to one portion of said dowel, said ring is of rigid material of sufficient size for adaptation into said front portion of said arm that enable slidably retain into said passage of said housing to provide engagement, said ring is to move said dowel between a first position wherein said snap-pin device is engaged to said housing and a second position wherein said snap-pin device is disengaged from said housing being accommodate for use by a human being.

18. The rack as according to Claim 17, further including a compression spring, said spring is of metal material of sufficient size to be adapted to said dowel to provide a limited degree of resilient force within a bore to move said dowel between a first position wherein said snap-pin device is engaged with said housing and a second position wherein said snap-pin device is disengaging from said housing.

19. The rack as according to Claim 18, wherein said dowel is inserted into said bore through its width portion of said arm in an inclined angle between interfacing end portion of said housing which is opposite side of pivotably mounting of said arm and said front portion of

said arm, further said dowel is of metal material of circular cross-section shaped, one end portion of said dowel has rounded edges to a U-shaped thereof convenient mating insertion into its respective said passage, middle longitudinal portion of said dowel is shrink to a smaller circular cross-section, said shrink portion is a shank thereof enable inclusion of said
5 compression spring and insertion to an eyelet thereof contain said dowel within their inclined respective said bore, end portion of said shank include an eyelet for insertion of said ring to facilitate withdrawing and disengagement of said arm from said housing,

whereby said snap-pin device is spring-loaded that facilitated a resilient mating insertion into respective said passage preventing avulsion of said arm from said housing.

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20. The rack as according to Claims 17 & 19, wherein said eyelet thereof contain said dowel is provided with a recess to accommodate said ring for holding said ring at withdrawn position.

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21. A foldable sun-shading device (not shown) for blocking of sun radiation generally mounted indoor above an opening of an external wall of a building, initially in a substantially horizontal position outside of the building and is fold inwardly for maintenance, comprising:

(a) a plurality of supporting arm of sufficient size comprising; a end portion of said arm is exposed for attachment to provide articulation for said arm, a forward end portion of said arm
20 is for containment and a remaining portion of said arm to provide for blocking of sun radiation,

(b) a plurality of elongated housing of sufficient size has a frustrum for receiving said end portion of said arm to provide pivotably mounting for articulation of said arm into said housing, opposed side walls and a top defining passage, said top and side walls adjoining to a front portion of said arm in a matching marge construction to provide containment for said arm,
25 further said housing include a base therein for mounting said housing to any surface to secure said rack, and

(c) a plurality of snap-pin device adapted into a front portion of said arm to be slidably retain into a passage of said housing to provide engagement when articulate adjacently.

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22. The shading device as according to Claim 21, further including a sheet of rigid material that is integral attach to said remain portion of said arm for blocking sun radiation.

23. The shading device as according to Claim 22 wherein said sheet of rigid material is made of polymer that is integral attach to top portion of said remain portion of said arm for
35 shading sun radiation for said opening.

24. The shading device as according to Claim 23 wherein said sheet of polymer has a

rectangular shape of sufficient size, further include means for joining comprises a set of bridge piece that joins a respective one portion of underside of said polymer to be attach to top portion of said remain portion of said arm.

5 25. The shading device as according to Claim 21, further including a plurality of flat shape of metal material of sufficient size that is integral attach to said remain portion at sequentially spaced of said arm for blocking sun radiation.

10 26. The shading device as according to Claim 25, wherein said flat shape is a louver that is integral attach to top portion of said remain portion of said arm, further include means for joining comprises a set of bridge clip that joins a respective one portion of said louver to be attach to top portion of said remain portion of said arm.

15 27. The shading device as according to Claim 26, wherein said louver is interposed attach to vertical portion of said remain portion of said arm, further include means for joining comprises a plurality of end piece that joins a respective one end portion of said louver to be attach to vertical portion of said remain portion of said arm.

20 28. The shading device as according to Claim 25, wherein said louver is a pole to provide suspension of clothes hangers for drying on said poles, further include means for joining comprises a plurality of end piece that joins a respective one end portion of said pole to be attach to vertical portion of said remain portion of said arm.

25 29. The shading device as according to Claim 28, wherein said pole to be attach to vertical portion of said remain portion of said arm is interposed inserted into a plurality of opening to provide support for said pole for suspension of clothes hangers for drying on said poles.

30 30. The shading device as according to Claim 29, further including a sheet of polymer has a rectangular shape of sufficient size, further include means for joining comprises a set of bridge piece that joins a respective one portion of underside of said polymer to be attach to top portion of said remain portion of said arm,

 whereby said pole is to provide for suspension of laundries for outdoor drying and said polymer is to provide shading of sun radiation or rain droplets.

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 31. The shading device as according to Claim 21, wherein said snap-pin device comprising:

(a) said snap-pin device comprising of a rigid part that can be adapted into said front portion of said arm to move between a first position wherein said snap-pin device is engaged with said housing and a second position wherein said snap-pin device is disengaging from said housing being accommodate for use by a human being, and

5 (b) retain means preventing said arm from avulsion when engaged.

32. The shading device as according to Claim 31, wherein said rigid part is a dowel having two end portions.

10 33. The shading device as according to Claim 31, wherein said dowel includes a ring adapted to one portion of said dowel, said ring is of rigid material of sufficient size for adaptation into said front portion of said arm that enable slidably retain into said passage of said housing to provide engagement, said ring is to move said dowel between a first position wherein said snap-pin device is engaged to said housing and a second position wherein said snap-pin
15 device is disengaged from said housing being accommodate for use by a human being.

34. The shading device as according to Claim 31, further including a compression spring, said spring is of metal material of sufficient size to be adapted to said dowel to provide a limited degree of resilient force within a bore to move said dowel between a first position wherein said
20 snap-pin device is engaged with said housing and a second position wherein said snap-pin device is disengaging from said housing.

35. The shading device as according to Claim 31, wherein said dowel is inserted into said bore through its width portion of said arm in an inclined angle between interfacing end portion
25 of said housing which is opposite side of pivotably mounting of said arm and said front portion of said arm, further said dowel is of metal material of circular cross-section shaped, one end portion of said dowel has rounded edges to a U-shaped thereof convenient mating insertion into its respective said passage, middle longitudinal portion of said dowel is shrink to a smaller circular cross-section, said shrink portion is a shank thereof enable inclusion of said
30 compression spring and insertion to an eyelet thereof contain said dowel within their inclined respective said bore, end portion of said shank include an eyelet for insertion of said ring to facilitate withdrawing and disengagement of said arm from said housing,

36. The shading device as according to Claims 33 & 35, wherein said eyelet thereof
35 contain said dowel is provided with a recess to accommodate said ring for holding said ring at withdrawn position.