

July 28, 1970

J. LIEBSCHER

3,521,757

LAUNDRY DRIER

Filed Feb. 20, 1969

4 Sheets-Sheet 1

FIG. 1

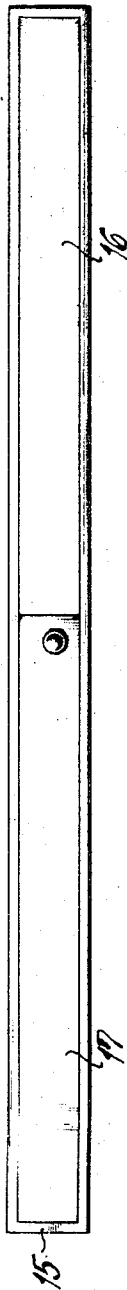
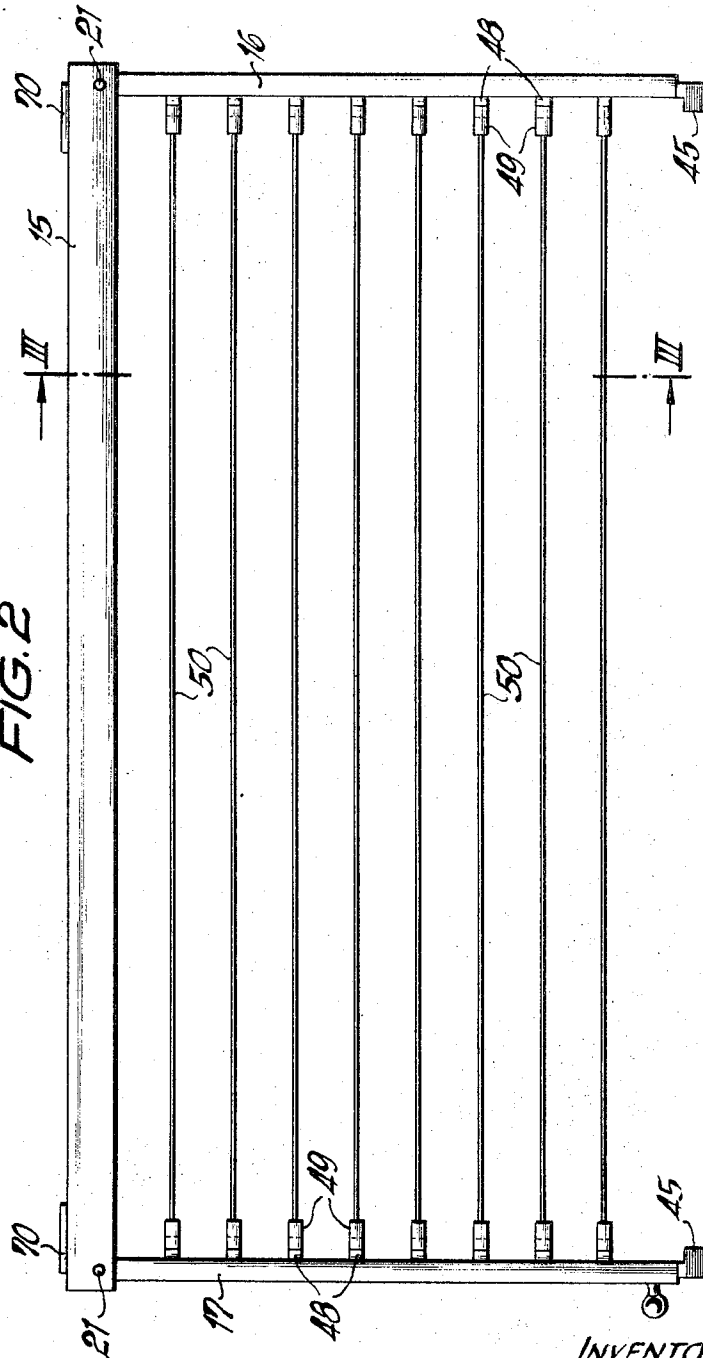


FIG. 2



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FIG. 3

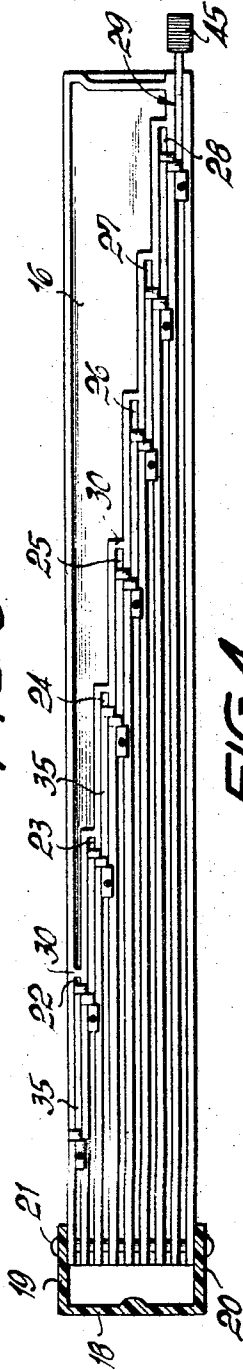


FIG. 4

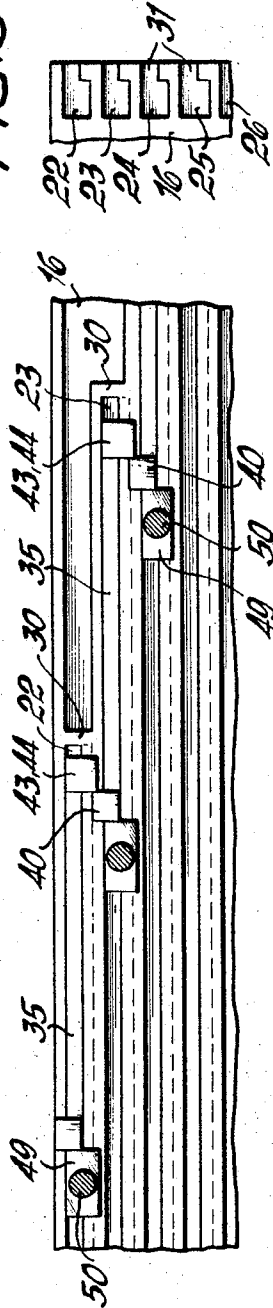


FIG. 5

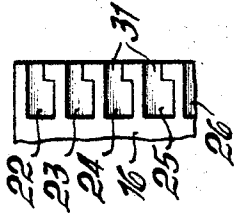


FIG. 6

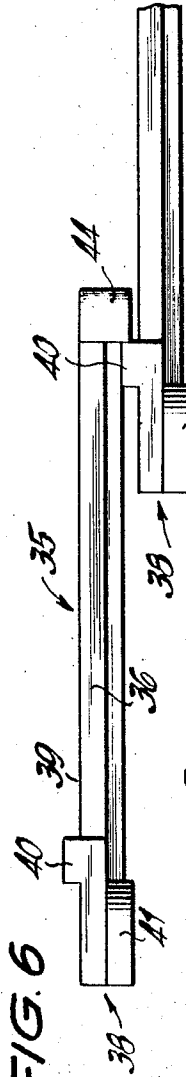
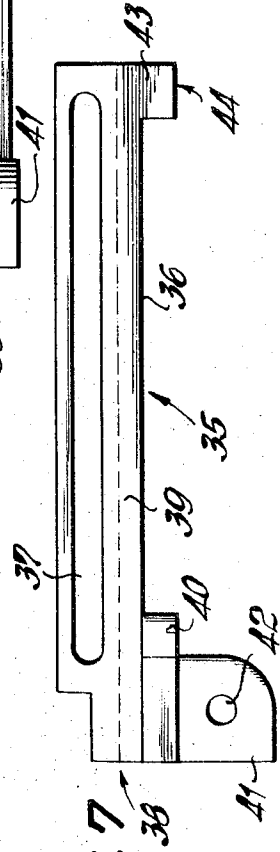


FIG. 7



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FIG. 8

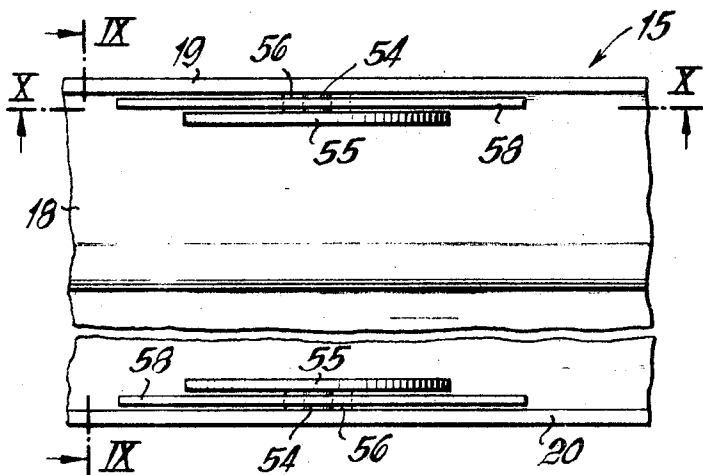


FIG. 9

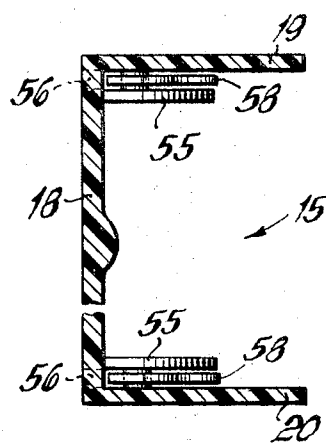


FIG. 10

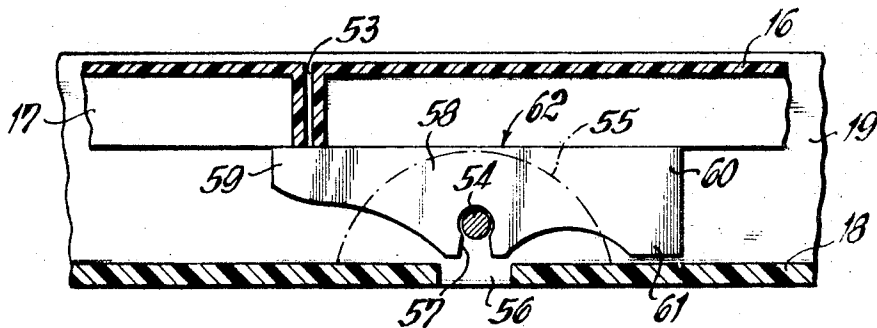
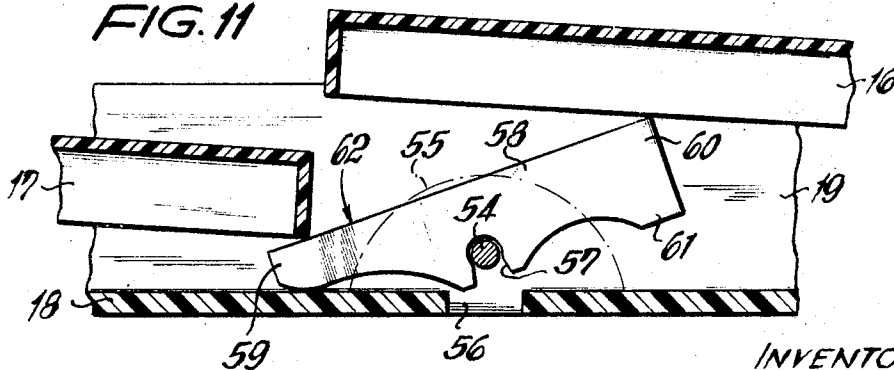


FIG. 11



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FIG. 12

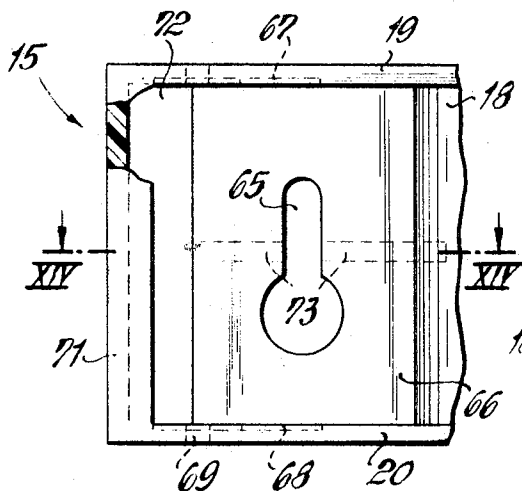


FIG. 13

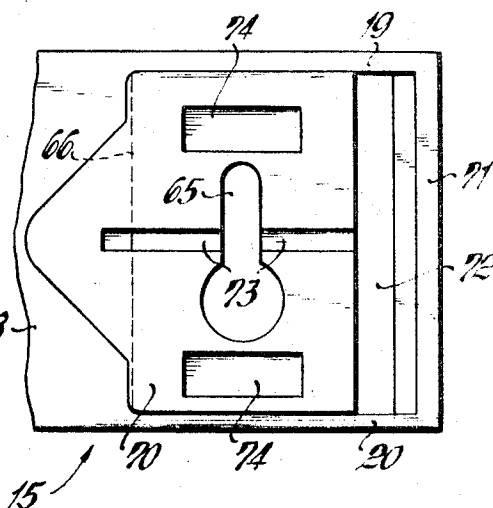


FIG. 14

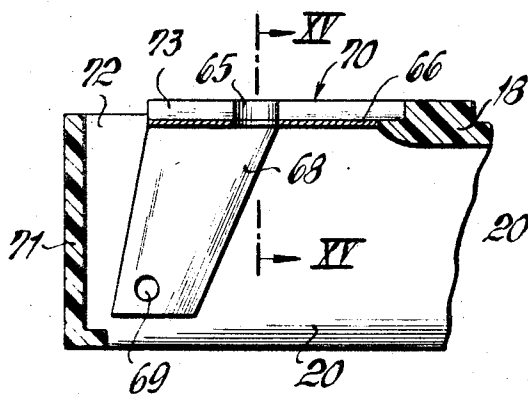
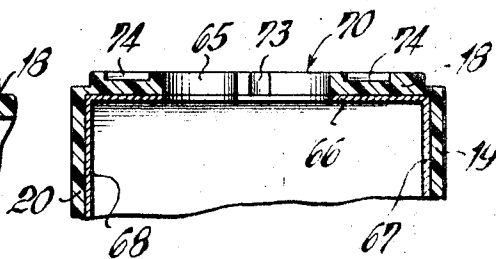


FIG. 15



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LAUNDRY DRIER

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U.S. Cl. 211—1.3

20 Claims

ABSTRACT OF THE DISCLOSURE

A laundry drier has an elongated base member and a pair of arms each turnably mounted on the base member at one end of the latter so that they can be pivoted between an inactive position in which they parallel the base member and an active position in which they extend normal thereto. Each arm is provided with a plurality of longitudinally extending parallel grooves and in each groove a slider is mounted for longitudinal movement therein. Connecting means connects all sliders of each arm so that they move consecutively when any one is moved. Hangers extend between associated sliders of the respective arms and a rocker arrangement is provided on the base member and engages the arms when the same are moved to their inoperative position for causing them to assume predetermined relative positions, and is operative for shifting one of the arms out of its inoperative position in response to movement of the other arm beyond the inoperative position thereof.

BACKGROUND OF THE INVENTION

The present invention relates generally to a laundry drier, and more particularly to a collapsible laundry drier. It is already known to provide collapsible laundry driers which, when opened, provide one or more clothes lines, rods, bars or the like on which laundry to be dried may be hung. However, these constructions suffer from various disadvantages and, while they are certainly usable, have not been found to be entirely satisfactory. Those skilled in the art will be aware of the problems and it is therefore not believed necessary to discuss these in detail. It is, accordingly, an object of the present invention to overcome such disadvantages.

More particularly it is an object of the present invention to provide an improved clothes drier of the collapsible type which is not possessed of the disadvantages present in the constructions known heretofore.

An additional object of the present invention is to provide a clothes drier of the type under discussion which in collapsed condition has considerably smaller dimensions than heretofore possible.

A concomitant object of the invention is to provide such a clothes drier wherein collapsing and opening of the arrangement is greatly simplified and wherein the movable components are guided reliably and automatically between their respective end positions in response to operation of the clothes drier to convert it from its inoperative position to its operative position, and vice versa.

SUMMARY OF THE INVENTION

In pursuance of the above objects, and others which will become apparent hereafter, one feature of my invention resides in the provision of a clothes drier of the type under discussion wherein an elongated base member has mounted thereto a pair of arms each having a front portion and a rear portion and each turnably connected with the base member at one end of the latter so as to be movable between an inactive position paralleling the base member and an active position extending normal thereto.

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The arms have respective surfaces which face one another when they are in active position. A plurality of parallel grooves is provided in each of the surfaces and extends from the respective rear portion longitudinally of the respective arm towards the corresponding front portion. A slider is mounted in each of the grooves for movement longitudinally thereof. Connecting means connects all sliders of each arm for consecutive movement when any one slider moves. Hanger means extends between associated sliders of the respective arms and rocker means is mounted on the base member and serves to engage the arms and to effect predetermined positioning thereof relative to one another when they are moved to their inoperative position, and for shifting one of the arms out of its inoperative position in response to movement of the other arm beyond the inoperative position thereof.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a front elevational view of the novel drier shown in collapsed condition;

FIG. 2 is a top-plan view of the drier of FIG. 1 shown in opened or operative position;

FIG. 3 is a section on the line III—III of FIG. 2, shown on an enlarged scale;

FIG. 4 is a fragmentary detail view of FIG. 3, shown on a further enlarged scale;

FIG. 5 is a fragmentary end-elevation of one of the arms shown in the embodiment of FIGS. 1-4, on the same scale as FIG. 4;

FIG. 6 is a fragmentary elevational detail view of FIG. 4, on a further enlarged scale;

FIG. 7 is a somewhat diagrammatic illustration of a slider for use in the illustrated embodiment;

FIG. 8 is a fragmentary elevation of the base member of the illustrated embodiment;

FIG. 9 is a section taken on the line IX—IX of FIG. 8;

FIG. 10 is a section taken on the line X—X of FIG. 8;

FIG. 11 is a view similar to FIG. 10 but illustrating operation of the components shown in FIG. 10;

FIG. 12 is a diagrammatic fragmentary elevational view of an end portion of the base member of the embodiment illustrated;

FIG. 13 is a rear view of FIG. 12;

FIG. 14 is a section taken on the line XIV—XIV of FIG. 12; and

FIG. 15 is a section taken on the line XV—XV of FIG. 12.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Discussing now the drawing in detail, it will be seen that in FIG. 1, I have illustrated a novel drier according to my present invention shown in collapsed condition in which it is inoperative. In FIG. 2, I have shown the same drier in opened or operative position and it will be seen from FIG. 2 that the drier according to my present invention comprises an elongated base member 15 and two arms 16, 17 whose combined length in the illustrated embodiments (compare FIG. 1) is substantially the same as the length of base member 15. The rear portion of each of the arms 16 and 17 is connected with the base mem-

ber 15, and more specifically connected therewith by a normally vertical pin 21 so as to be turnable with reference to the base member 15 from a position in which each arm 16, 17 extends in parallelism with the base member 15 to a position in which it extends normal thereto, the latter position being the operative position shown in FIG. 2. As shown in FIGS. 3 and 9, incidentally, I prefer to make the base member 15 with a substantially U-shaped cross section so that it has a bottom wall or bight 18 provided with a longitudinal rib and an upper as well as a lower leg 19, 20, respectively, extending along the bottom wall 18. It might be more specifically and accurately stated that the wall 18 is a back wall because it will normally be placed against a support, such as the wall of a room or the like with the arms 16, 17 in operative position extending substantially horizontal.

The inner surfaces of the arms 16, 17, that is the surfaces which face one another when the arms are in the position shown in FIG. 2, are provided with longitudinally extending grooves 22-29 which extend forwardly from the respective rear end and which, in accordance with the present invention, are of different lengths. In other words, as shown in the drawing and particularly in FIGS. 3 and 4, successive grooves 22-29 are of progressively different lengths. Transverse wall portions 30 close the ends of the grooves 22-28 which are proximal to the respective free end portions of the arms 16 and 17; the end of the groove 29 in each case is open. The opposite ends of the grooves 22-29, that is the ones closer to the base member 15, are open but are blocked when the pins 21 are inserted which connect the respective arms 16 and 17 with the base member 15. As shown in FIG. 5, the cross-sectional configuration of the grooves 22-29 is decreased at 31.

Each of the aforementioned grooves 22-29 accommodates a slider 35 which is longitudinally slidable therein. As shown in FIGS. 5, 6 and 7, the configurations of the sliders 35 are so selected that they are readily receivable in the respective grooves 22-29, and each slider provided comprises an elongated portion 36 which is provided with a longitudinally extending recess 37 to save material when the sliders are molded from synthetic plastic material. I wish to emphasize that other material is also suitable but the use of synthetic plastic material is preferred. Each slider further comprises a projection 38 extending from the portion 36 and constituting a lug 41 which projects over the forward end face of the portion 36, as well as a projection 40 which extends above the upper surface 39 of the projection 36. The lug 41 is provided with a cutout 42. From the other end of the portion 36 extending beyond the forward end face thereof there projects a projection 43 having a downwardly directed portion 44. The portions 40 and 44 of each slider serve, as particularly clearly illustrated in FIG. 4, for connecting the respective sliders with sliders received in the adjacent grooves.

FIG. 4 shows that the projections 43 and 44 of the sliders received in the groove 22 constitute in the operative position of the drier an abutment for the projection 40 of the slider 35 received in the next-following groove 23. In this manner all sliders of each of the arms 16 and 17, respectively, are connected with one another so that when one slider moves, all sliders necessarily move consecutively. An exception is the slider received in the groove 29 which is provided with an engagement portion 45 which slightly projects from the free end of the respective arm in the operative position of the arrangement.

When the arrangement is to be collapsed and the sliders are moved backwards towards the member 15, they can all be moved to superimposed positions with the projection 40 of each slider 35 abutting against that side face of the projection 38 below the projection 40 of the adjacent slider which faces towards the respective projection 43. A pressure exerted against the engaging pro-

jections 45 thus moves all of the sliders 35 of the respective arms 16 and 17 from the inoperative position to the operative position shown in FIG. 3, and a force exerted in direction counter thereto returns the sliders to inoperative position in which the device can be collapsed. The presence of the pins 21 prevents the sliders from exiting through the open rear ends of the respective grooves 22-29.

Laundry-supporting elements 50 are provided, which may be ribs or the like but preferably are bars or rods; as shown in the drawing, the laundry-supporting elements 50 which are here bars, are connected with the respective sliders 35 via connecting members 49 with which they are rigid and which are in turn turnably mounted on the projections 41 of the respective sliders 35 through the intermediary of a pin 48 extending through the respective cutout 42. If ropes or the like are substituted for the bars 50, they could be connected to the connecting members 49 or directly to the projections 41.

To move the device from the operative position of FIG. 2 into the position of FIG. 1 where it is collapsed, the sliders 35 are all moved inwardly towards the base member 15 until the arms 16 and 17 can be pivoted about the pins 21 into positions of parallelism with the base member 15. As this takes place, the connecting members 49 with the bars 50 tilt with respect to the sliders 35 so that the bars 50 become positioned in concealed condition behind the arms 16 and 17 which latter are alone visible in collapsed condition.

The base member 15 is provided with end walls 18, with the legs 19 and 20 and with a supporting wall 55. From each of the legs 19 and 20 there projects a pin 54 which are both offset in direction towards the arm 15 and which project opposite the gap 53 between the free ends of the arms 16 and 17; the pins 54 constitute a connection with the supporting wall 55 which extends from the rear or back wall 18. If the base member 15 is molded from synthetic plastic material, the rear wall 18 may be provided with openings 56 for forming the pins 54.

In accordance with the invention I provide two double-armed levers 58 which are each provided with a slotted recess 57 straddling a respective one of the pins 54 so that each double-armed lever 58 is rockable about the axis defined by the respective associated pin 54. The free end portion of one arm 59 of each lever 58 extends below the arm 17 and the arm 60 of each lever 58 extends below the arm 16. The arm 60 of each lever 58 is further provided with an abutment portion 61 which, when the respective double-armed levers 58 are in the position shown in FIG. 10, abuts against the wall 18 of the base member 15 and thus assures that the upper surface 62 of the double-armed lever 58 extends in parallelism with the wall 18. This is the normal position of the lever 58 and in this position the portion 61 abuts against the wall 18. With the lever 58 in this position, turning of the arms 16 and 17 to their inoperative position shown in FIG. 1 necessarily aligns the arms 16 and 17 because of their support on the surface 62, as shown in FIG. 10.

To open the arrangement, that is to move the arms 16 and 17 to their operative position, it is simply necessary to press down on the arm 17 which thereby tilts the lever in counterclockwise direction as illustrated in FIG. 11 with the result that the arm 60 of the lever 58 lifts the arm 16 upwardly to an extent that it can be readily grasped and turned to its operating position. Thereupon the arm 17 can be similarly turned to its operating position because its free end is now readily accessible, and subsequently the projections 45 may be gripped to pull out the sliders 35 and thereby to move the bars 50 to a position of readiness.

Referring, finally, to FIGS. 12-15 it will be seen that there I have illustrated details of the construction of the end portions of the base member 15. It will be seen that

each end portion of the base member 15 is provided with an aperture 65 which advantageously is of keyhole-shaped configuration and which serves to mount the arrangement on a wall, for instance by fastening screws, nails, hooks or the like in the wall or in another support and hanging the arrangement onto them in well known manner. Because the base member 15 advantageously consists of synthetic plastic material as already mentioned and for reasons of economy of manufacture, it is desirable to reinforce it in the region of these end portions and for this purpose it is provided with metallic plate-like inserts 66 which also serve to reinforce the pins 21.

As shown in FIGS. 12-15 the plates 66 abut against the inside of the wall 18 and are provided with lugs 67 and 68 which respectively abut against the legs 19 and 20 of the base member 15. Referring to FIG. 14 it will be seen that the lugs 67 and 68 extend to the cutouts 69 wherein the pins 21 are provided, and are of substantially triplicium-shaped outline. Their wider portion, that is the wider base, is narrower than the plate 66 and connected with the same.

As shown in FIGS. 12-15, and also in FIG. 2, the base member 15 is provided in the region of the apertures 65 with projecting reinforcements 70 which are slightly larger than the size of the respective plate 66.

The provision of the plates 66 from metallic material and of the base member 15 from synthetic plastic material could create a problem because of the differential coefficients of thermal expansion of the materials. To avoid difficulties in this respect the base member 15 is provided with cutouts or recesses 72 in the region adjacent the wall portion 71 and immediately adjacent one narrower side of the respective plate 66. In the region of the wall 18 located behind the respective plate 66, that is in registry therewith, there is provided a substantially centrally located slot 73 and this, in conjunction with the cutout or recess 72, permit significant differential in the coefficients of thermal expansion of the materials without any difficulties. They make it possible for the metallic inserts, that is the plates 66 with their respective lugs 67 and 68, to transmit forces acting upon them in the region of the apertures 65 and via the pins 21, to the remainder of the base member 15 over large surface areas. To facilitate manufacture of the base member 15 the reinforcing portion 70 will advantageously be provided with shallow depressions 74 in the regions adjacent the apertures 65, as shown in the drawing.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of constructions differing from the types described above.

While the invention has been illustrated and described as embodied in a laundry drier, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

I claim:

1. An arrangement of the character described, comprising in combination, an elongated base member; a pair of arms each having a front portion, and a rear portion turnably connected with said base member at one end of the latter, for movement between an inactive position paralleling said base member and an active position extending normal thereto, said arms having respective surfaces facing one another in said active position; a plurality of parallel grooves provided in each of said surfaces and extending from the respective rear portion longitudinally of the respective arm towards the respective front portion; a slider mounted in each of said grooves for movement longitudinally thereof; connecting means connecting all sliders of each arm for consecutive movement; hanger means extending between associated sliders of the respective arms; and rocker means mounted on said base member and operative for engaging said

arms and effecting predetermined positioning thereof relative to one another when the same are moved to said inoperative position and for shifting one of said arms out of said inoperative position in response to movement of the other arm beyond said inoperative position.

2. An arrangement as defined in claim 1, wherein the combined length of said arms is substantially equal to the length of said elongated base member.

3. An arrangement as defined in claim 1, said rocker means being provided on a face of said base member which is juxtaposed with said arms when the latter are in said inoperative position.

4. An arrangement as defined in claim 3, said rocker member being rockable about an axis substantially normal to the elongation of said arms when the latter are in said inoperative position and substantially parallel with, between said arms when the same are in said operative position.

5. An arrangement as defined in claim 4, wherein said rocker means comprises a rockably mounted double-armed lever.

6. An arrangement as defined in claim 5, wherein said axis is closer to one end of said base member than to the other end so as to be offset towards that one of said arms which is associated with said one end.

7. An arrangement as defined in claim 4, said rocker means comprising a double-armed lever in sliding engagement with said face of said base member.

8. An arrangement as defined in claim 7, said rocker means including a pin extending from said face and defining said axis, and said double-armed lever being provided with a cutout straddling said pin so that said lever is rockable about said axis.

9. An arrangement as defined in claim 7, said double-armed lever being rockable between a rest position and an operated position; and further comprising an abutment portion provided on one arm of said lever for engaging said base member and limiting movement of said lever relative thereto in response upon movement of said lever to said rest position thereof.

10. An arrangement as defined in claim 4, said base member being of substantially U-shaped cross section; and wherein said rocker means includes an additional double-armed lever similar to the first-mentioned one and arranged mirror-symmetrically with reference thereto.

11. An arrangement as defined in claim 1, wherein successive grooves in each of the respective arms have progressively different lengths.

12. An arrangement as defined in claim 1, wherein said grooves have groove ends facing the respective front portions, and wherein said groove ends are at least partially closed.

13. An arrangement as defined in claim 1, said hanger means including a plurality of rods each extending between and pivotally connected with a pair of sliders respectively provided on said arms.

14. An arrangement as defined in claim 1, each of said arms including one of said sliders which is proximal to the respective front portion when said arms are in said operative position; and wherein said one sliders are each provided with a gripping portion projecting beyond the respectively associated front portion when said arms are in said operative positions.

15. An arrangement as defined in claim 1, wherein at least said base member consists of synthetic plastic material.

16. An arrangement as defined in claim 15, said base member having spaced end portions each provided with a mounting aperture, and a reinforcing plate overlying each of said apertures abutting against a face of said base member which is juxtaposed with said arms when the same are in said inoperative positions, each of said reinforcing plates including two projections extending away from the respective aperture.

17. An arrangement as defined in claim 16, wherein said reinforcing plates consist of metallic material.

18. An arrangement as defined in claim 17, said base member being provided in the region of each of said reinforcing plates with at least one cutout so positioned as to provide space for expansion of the associated reinforcing plate in the event of thermal expansion of the latter at a rate different from that of said base member.

19. An arrangement as defined in claim 18, said base member having opposite end walls proximal to the respective reinforcing plates, and said cutouts being provided intermediate the respective end wall and the associated reinforcing plate.

20. An arrangement as defined in claim 19; further comprising a pair of additional cutouts each provided in said face opposite the respective reinforcing plate.

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