July 21, 1953 W. L. MORRISON 2,645,863

CLOTHES DRIER

Filed Feb. 9, 1952 4 Sheets-Sheet 1

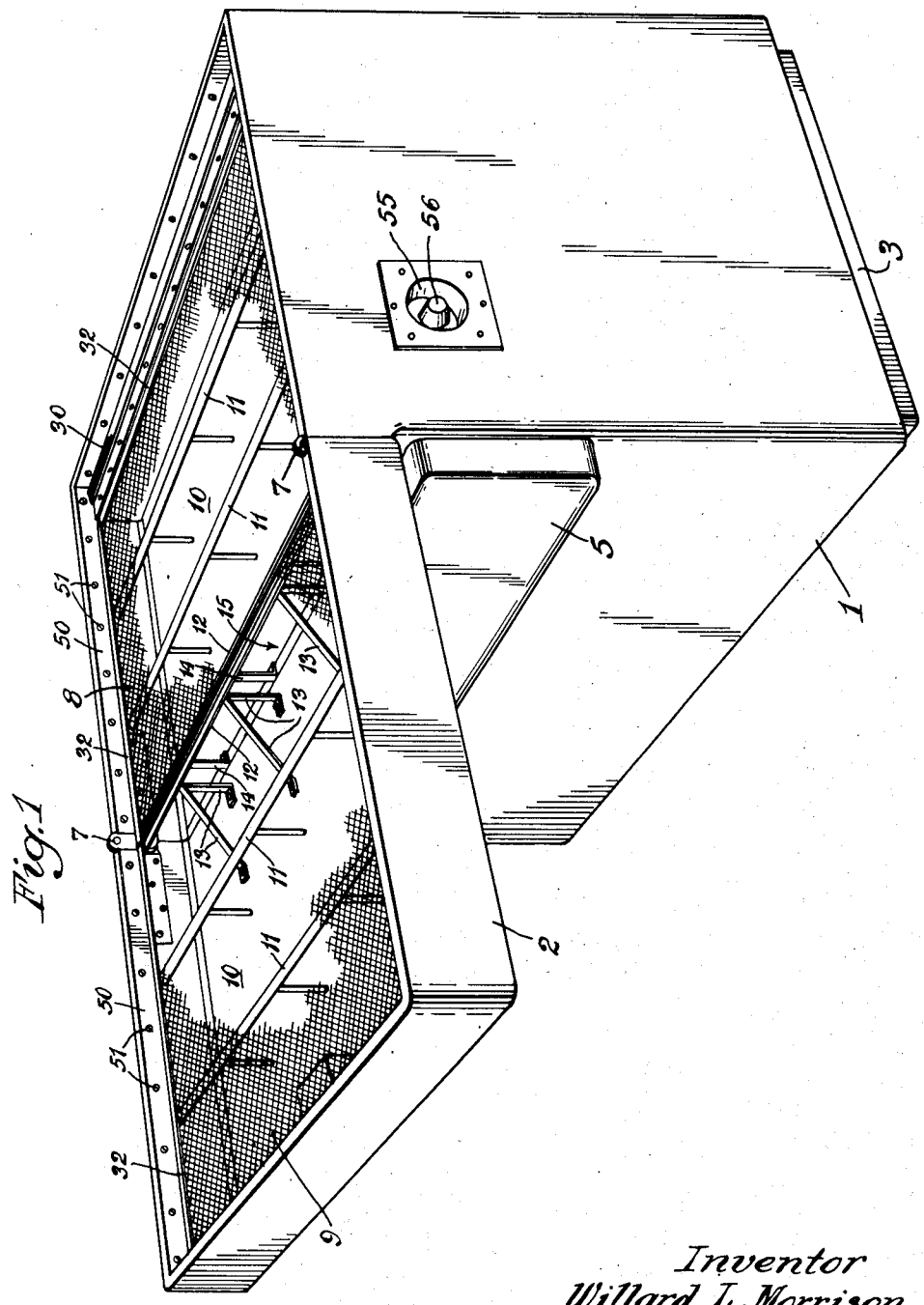


Fig. 1

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Fig. 2

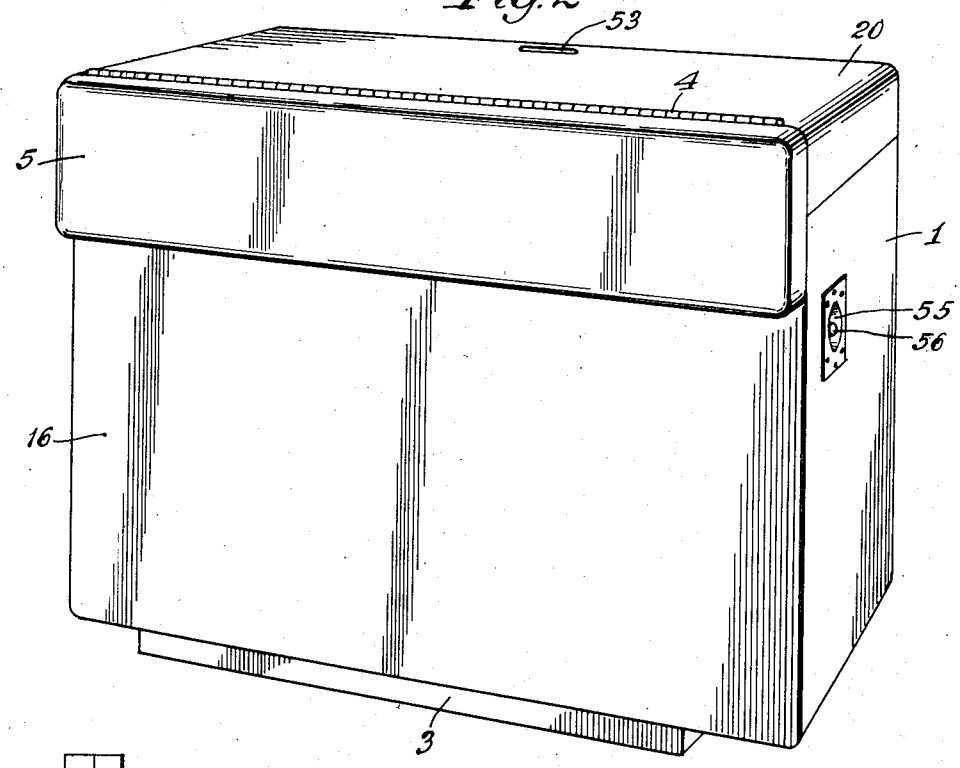
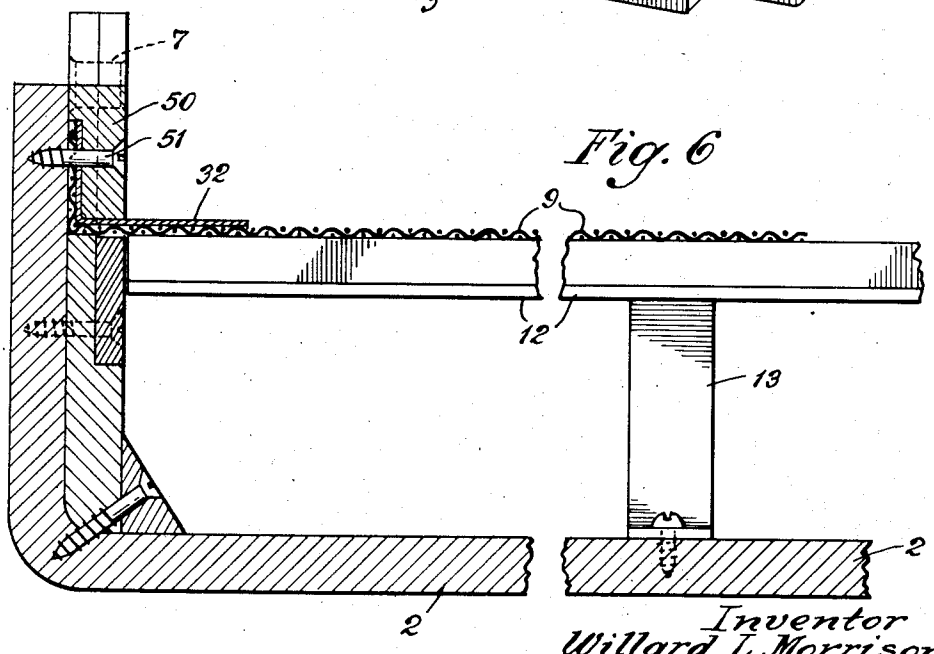


Fig. 6



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CLOTHES DRIER

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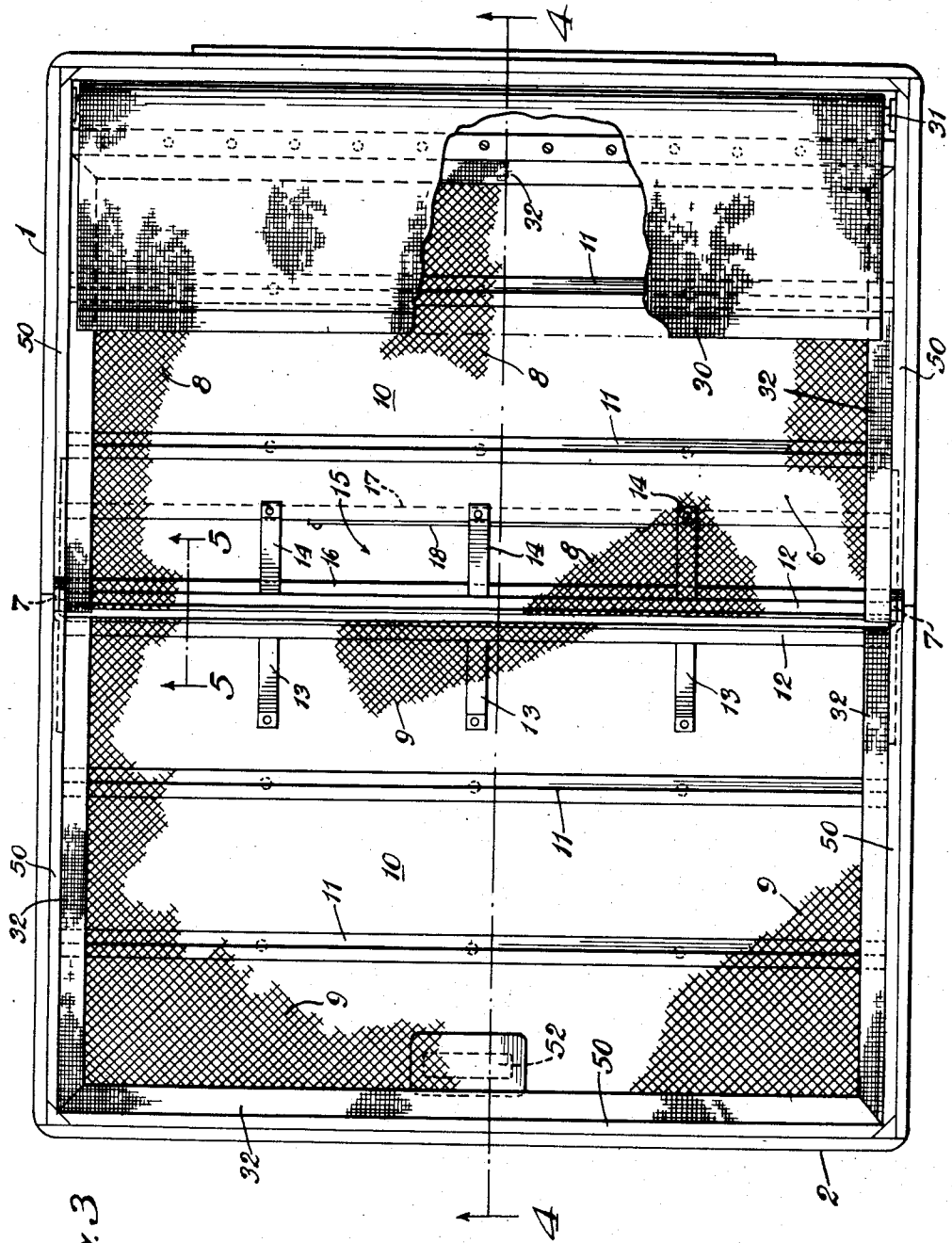


Fig. 3

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CLOTHES DRIER

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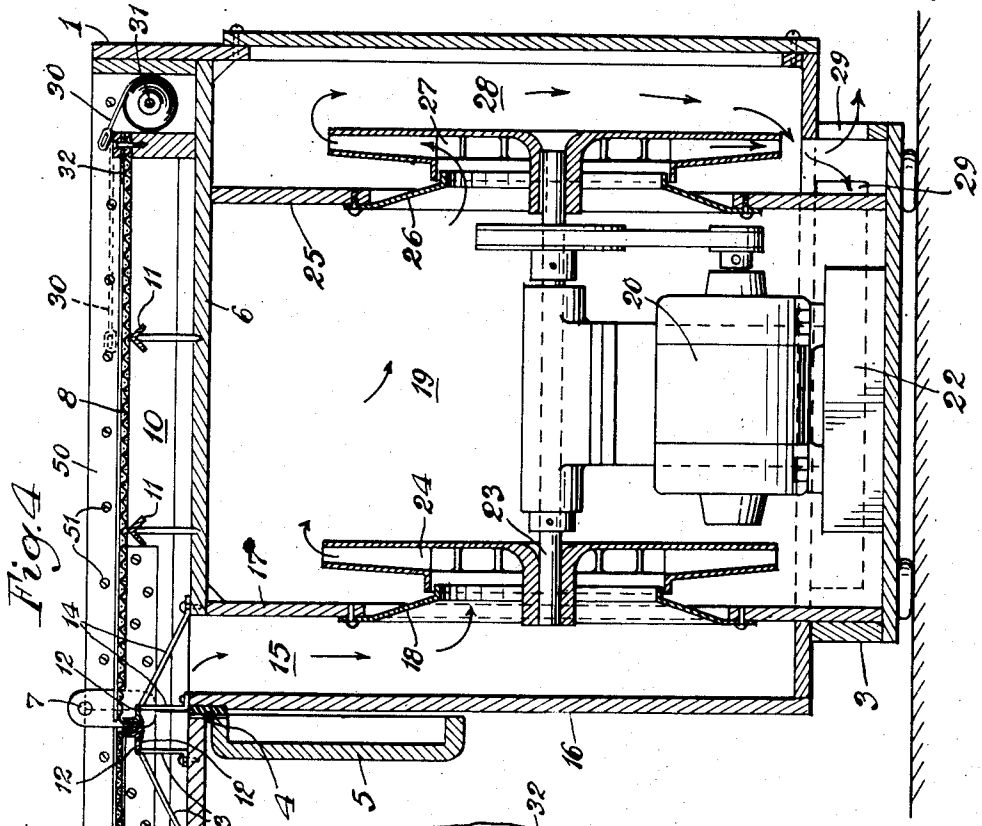


Fig. 4

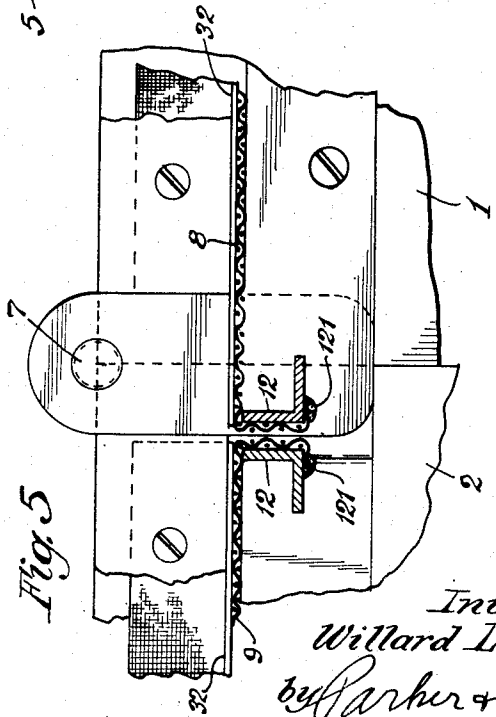


Fig. 5

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Patented July 21, 1953 2,645,863

UNITED STATES PATENT OFFICE

2,645,863

CLOTHES DRIER

Willard L. Morrison, Lake Forest, Ill.

Application February 9, 1952, Serial No. 270,802

18 Claims. (Cl. 34—239)

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My invention relates to improvements in clothes dryers. It has for one object to provide a portable extensible clothes dryer wherein clothes are dried in smooth unwrinkled condition and wherein drying is rapid and effective.

Another object of my invention is to provide an apparatus which may serve interchangeably as a dryer and as a kitchen table.

Another object of the invention is to provide a drying apparatus whereby air is sucked through a layer or layers of fabric, spread out on a screen so that at least with respect to many of the articles to be dried, ironing after drying is unnecessary.

Other objects will appear from time to time throughout the specification and claims.

This application is a continuation in part of my co-pending application Serial No. 167,372 filed June 10, 1950, now abandoned.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein

Figure 1 is a perspective of the device in open position with the supporting part of the screen;

Figure 2 is a perspective of the device in the closed position;

Figure 3 is a plan view of the open dryer;

Figure 4 is a section along the line 4—4 of Figure 3;

Figure 5 is a section on an enlarged scale along the line 5—5 of Figure 3;

Figure 6 is a section on an enlarged scale along the line 6—6 of Figure 4.

Like parts are indicated by like characters throughout the specification and drawings.

My dryer comprises a rectangular box 1 having a hinged cover 2 pivoted on one side of the box. It rests on a base 3. Pivoted at 4 on the cover 2 above the hinge is a closing flap 5. The back of the box including the depth of the cover 2 and a substantially equal depth below the horizontal partition 6, beneath the cover 2 is cut away. This opening is closed by the flap 5 when the cover is in the folded or inoperative position. The cover is hinged at 7 at both ends of the box so that it can be folded outwardly from the position shown in Figure 2 to the position shown in Figures 1 and 4. When in this position, screens 8 and 9 bound the upper side of the suction chamber 10 defined within the top of the box and the cover. 11 indicates sharp edged cross members projecting upwardly from the cover 2 and the horizontal partition 6 to support the screen. The screen is attached to the outer periphery of the cover and of the box as indicated by the holding clamps 50 held in place by screws 51 so that the edges of the screen are permanently attached to three sides of the cover and three sides of the box. The abutting edges of the screen are wrapped around angle bars 12 which extend respectively across the box and the cover and are anchored at 121 so that when the cover is in the open position, the effective opposed edges of the screen abutting being in sufficiently close contact to permit no passage of solids between them but there being

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sufficient clearance so that air may pass upwardly between the members 12. Struts 13 in the cover and struts 14 in the box hold the cross members 12 in position against the tension of the screen. Thus there is a continuous generally flat clothes supporting screen supported in the box and the cover and defining the upper portion of the suction chamber 10. These screens are located slightly below the upper level of the vertical walls of box and cover. It is on this screen that clothes to be dried may be loosely thrown or preferably spread out in one or more layers.

15 is a suction passage bounded by the outer wall 16 of the box 1 on one side and by a vertical interior wall 17 on the other side. This suction passage communicates with the suction chamber 10 and extends substantially from end to end of the box. The wall 17 is centrally apertured and shrouded at 18 to communicate with a motor chamber 19. Contained within the motor chamber 19 is an electric motor 20 mounted on a support 22 driving a shaft 23 which in turn carries a suction fan 24.

The intake side of the suction fan is so associated with the shroud 18 that when the fan is rotated by the motor 20 air is drawn in through the screens 8, 9 into the suction chamber 10 through the suction passage 15, the shroud 18 and discharged into the motor chamber 19, thus exerting a suction on and drawing air through the fabric which is to be dried, supported on the screens 8 and 9.

The motor chamber 19 is bounded on the side opposite to the partition 17, that is on the back of the box as it is in its normal position against the wall of the laundry by a vertical partition 25 centrally apertured and shrouded at 26. The shroud 26 is so related to the intake side of a second stage fan 27 mounted on the shaft 23 so that air from the motor chamber 19 is drawn by the fan 27 into the discharge chamber 28, thence through ports 29 on the side and back of the box so as to insure that the air discharged by the two stage fan system at high velocity and containing water drawn from the clothes will not be projected against the feet and legs of the operator.

A two-stage fan system gives conveniently adequate vacuum to dry clothes with great rapidity. Of course a single fan might be used but a larger fan and higher velocities would be required and thus a noisy, less satisfactory apparatus would result.

Experience teaches that when bath towels and the like, which are among the most difficult fabrics to dry, are laid in a number of layers on the screens 8 and 9, and the fans are rotated to exert a suction, the air is drawn through the various layers of fabric, extracts the water from them and accomplishes an exceedingly rapid drying of the fabric. As many as nine, ten or a dozen layers of bath towels can be satisfactorily dried in this manner and since they are laid out in smooth and level condition on the screen, such articles when dried are ready to be folded and put away without ironing. That situation is equally

true with respect to lighter fabrics. The screen is so fine that it leaves no deleterious imprint on the dried fabrics and the suction drawing air through the fabric results in thoroughly adequate drying without any heating whatever. The ambient air surrounding the apparatus when drawn through layers of fabric, one or more layers, is entirely adequate and sufficient to dry the clothes.

When the dryer is in the collapsed position as shown in Figure 2, the flap **5** on the front of the dryer closes the opening between the cover and the case or box. When the dryer is in the open position as shown in Figures 1 and 4, the flap 5 hangs down below the opening and offers no interference whatever.

When the dryer is in the collapsed position of Figure 2, it makes a sightly, inconspicuous piece of laundry furniture and the smooth top may be used just as any table is used in the laundry. The arrangement is such and the fact that the cover and box are hinged together at two widely spaced points only results in a structure where the screen is tight at all times and when the box or dryer is in the open position, the two screens are in alignment and provide a continuous foraminous supporting surface on which goods to be dried may be placed.

The suction duct **15** extends the entire length of the box and so the entire width of the suction chamber **10**. Thus there is an even and smooth flow of air through the goods to be dried through the screen and through the suction chamber **10** to the duct **15**.

Under some circumstances it may be that not enough material will be presented for drying to cover the entire combined area of the screens **8** and **9**. If this is the case, the fabric mantle **30** wound on a roller **31** is drawn out and laid over a portion ofthe screen so as to furnish a resistance to air flow. It will be understood that drying is accomplished by causing the air to actually pass through the fabric rather than to pass around it and so if there are substantial gaps left between pieces of fabric, those gaps must be closed. Under some circumstances this canvas **30** may cover only part of the screen. Under other circumstances, experience has taught it is desirable to cover the entire screen, perhaps with clothes to be dried beneath it or perhaps with clothes over it as the case may be.

In order to insure that a sufficient closure over the entire area is provided, I provide also around the outer periphery of the screens **8** and **9**, a fabric strip **32** which makes a complete seal with the clothes laid on the screen or with the fabric **30** as the case may be. It will be understood that the fabric **30** and the sealing strips **32** are both of them air pervious. It is not desired to prevent the flow of air, merely to insure a resistance to the air flow throughout the entire area so that the movement of air through the clothes on the entire area will be generally uniform or at least sufficiently uniform to insure a passage of air at high velocity under suction through all the clothes presented to the dryer.

52 is a hand hole registering with a slot **53** in the horizontal surface of the cover so as to provide a smooth and unobstructed surface while making it possible for the operator to reach over and rotate the cover into the operating position. **55** is an aperture in the end wall of the housing enclosing a switch button **56** whereby the motor may be started and stopped.

I claim:

1. In a clothes dryer, a housing and a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, and a suction conduit extending downwardly from the suction chamber to the suction fan.

2. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, and a suction conduit, extending downwardly from the suction chamber to the suction fan, the conduit extending longitudinally along substantially the entire width of the abutting screen sections.

3. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, and a suction conduit extending downwardly from the suction chamber to the suction fan, the conduit being located adjacent that side of the housing on which the cover is pivoted.

4. In a clothes drier, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, and a suction conduit extending downwardly from the suction chamber to the suction fan, the conduit being located adjacent that side of the housing on which the cover is pivoted and extending longitudinally along substantially the entire width of the abutting sections.

5. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the parti-

tion, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, a suction conduit extending downwardly from the suction chamber to the suction fan, and means for holding the abutting edges of the screen sections in the housing and cover respectively in fixed position with respect to the housing and cover.

6. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, a suction conduit extending downwardly from the suction chamber to the suction fan, and means for holding the abutting edges of the screen sections in the housing and cover respectively in fixed position with respect to the housing and cover, such holding means being so positioned that when the cover is in the open position, a space is left between the abutting screen edges substantially equal to the space between adjacent screen wires in the screens.

7. In a clothes dryer, a housing, a horizontal partition, adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, a suction conduit extending downwardly from the suction chamber to the suction fan, and means for holding the abutting edges of the screen sections in the housing and cover respectively in fixed position with respect to the housing and cover, the means for holding the abutting screen edges in position extending respectively from the partition and the cover top toward the screens and spaced apart to permit free flow of air across the partition and the cover top.

8. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the

housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, a suction conduit extending downwardly from the suction chamber to the suction fan, and spaced means interposed respectively between the screen sections and the horizontal partition and the cover top for holding the screen sections in parallelism respectively with the partition and cover top.

9. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, a suction conduit extending downwardly from the suction chamber to the suction fan, and means for supporting the screen sections associated with the horizontal partition and the cover top in such wise that one screen section extends beyond the pivot, the other screen section terminates short of the pivot whereby the cover may be rotated between open and closed position without interference between the abutting screen edges.

10. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, and a vertical partition in the housing closing the space below the horizontal partition, the vertical partition being centrally apertured and defining with the walls of the housing a suction passage open at the top for the entire width of the housing, the fan being adapted to draw air through the aperture from the suction passage.

11. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, and a vertical partition in the housing closing the space below the horizontal partition, the vertical partition being centrally apertured and defining with the walls of the housing a suction passage open at the top for the entire width of

the housing, the fan being adapted to draw air through the aperture from the suction passage, the housing wall on the discharge side of the vertical partition being apertured for discharge of air from the housing.

12. In a clothes dryer, a housing, a horizontal partition adjacent the top of and partially closing the housing, a suction fan below the partition, a cover pivoted on the housing on a horizontal axis so spaced with respect to the partition and the cover top that when the cover is rotated to open position, the cover top and the horizontal partition are in horizontal alignment, separate screen sections in the cover and in the housing so positioned that when the cover is in the open position these screen sections abut along one edge, are in horizontal alignment and define a suction chamber between the screen sections, the cover top and the horizontal partition, and a vertical partition in the housing closing the space between the horizontal partition, the vertical partition being centrally apertured and defining with the walls of the housing a suction passage open at the top for the entire width of the housing, the fan being adapted to draw air through the aperture from the suction passage, the housing wall on the discharge side of the vertical partition being apertured for discharge of air from the housing, the discharge aperture being downwardly disposed below the vertical housing wall adjacent but above the bottom thereof.

13. In a clothes dryer, a housing having vertical, front, back and side walls open at the top, a horizontal partition beneath the open top of the housing, a cover having top, side and back walls, hinged on the housing, the hinge axis being coextensive with the intersection of a plane defined by the top edges of the side walls of housing and cover and a plane substantially co-extensive with the outer surface of the front wall of the housing, the top of the cover and the partition wall being in alignment when the cover is open, the front wall of the housing terminating at the level of the horizontal partition.

14. In a clothes dryer, a housing having vertical, front, back and side walls open at the top, a horizontal partition beneath the open top of the housing, a cover having top, side and back walls, hinged on the housing, the hinge axis being coextensive with the intersection of a plane defined by the top edges of the side walls of housing and cover and a plane substantially co-extensive with the outer surface of the front wall of the housing, the top of the cover and the partition wall being in alignment when the cover is open, the front wall of the housing terminating at the level of the horizontal partition, the horizontal partition terminating short of the front wall of the housing to define with the housing side walls, an air port open downwardly below the horizontal partition.

15. In a clothes dryer, a housing having vertical, front, back and side walls, open at the top, a horizontal partition beneath the open top of the housing, a cover having top, side and back walls, hinged on the housing, the hinge axis being coextensive with the intersection of a plane defined by the top edges of the side walls of housing and cover and a plane substantially co-extensive with the outer surface of the front wall of the housing, the top of the cover and the partition wall being in alignment, when the cover is open, the front wall of the housing terminating at the level of the horizontal partition, screens in housing and in the cover spaced below the open top of the housing and the open top of the cover when in the open position, said screens being in horizontal alignment.

16. In a clothes dryer, a housing having vertical, front, back and side walls open at the top, a horizontal partition beneath the open top of the housing, a cover having top, side and back walls, hinged on the housing, the hinge axis being coextensive with the intersection of a plane defined by the top edges of the side walls of housing and cover and a plane substantially co-extensive with the outer surface of the front wall of the housing, the top of the cover and the partition wall being in alignment when the cover is open, the front wall of the housing terminating at the level of the horizontal partition, the horizontal partition terminating short of the front wall of the housing to define with the housing side walls, an air port open downwardly below the horizontal partition, screens in housing and in the cover spaced below the open top of the housing and the open top of the cover when in the open position, said screens being in horizontal alignment.

17. In a clothes dryer, a housing, a cover pivoted thereon adapted in one position to close the housing and in another position to extend laterally therefrom, a horizontal partition wall in the housing spaced below the open top thereof and in alignment with the top of the cover when the latter is in the open position, screen members mounted in housing and cover, the distance between such screen members and the horizontal partition and the housing cover being substantially the same, the cover being pivoted to the housing at the opposite sides of the housing only, means for supporting opposed edges of the screen respectively in the housing and cover, said means being adapted to resist lateral tension of the screen.

18. In a clothes dryer, a housing, a cover pivoted thereon adapted in one position to close the housing and in another position to extend laterally therefrom, a horizontal partition wall in the housing spaced below the open top thereof and in alignment with the top of the cover when the latter is in the open position, screen members mounted in housing and cover, the distance between such screen members and the horizontal partition and the housing cover being substantially the same, the cover being pivoted to the housing at the opposite sides of the housing only, means for supporting opposed edges of the screen respectively in the housing and cover, said means being adapted to resist lateral tension of the screen, said supporting means comprising angle bars about which the opposed edges of the screens are wrapped, means for anchoring the edges to the angle bars, the angle bars being so spaced that when the cover is in the open position part of the screen members wrapped around them are parallel and in close engagement.

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