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Purnell

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[54] **PORTABLE COLLAPSIBLE DARKROOM**

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[52] **U.S. Cl.** **355/27,** 354/307

[51] **Int. Cl.** **G03b 27/32**

[58] **Field of Search** 95/90, 91, 92; 355/27

[56] **References Cited**

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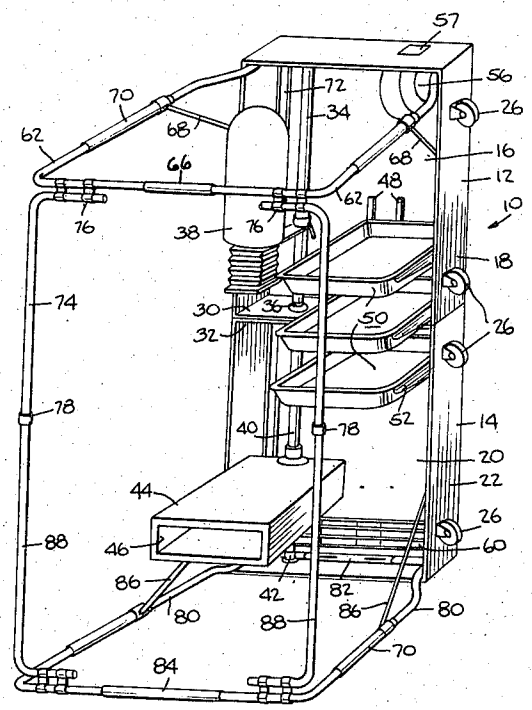
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[57] **ABSTRACT**

A portable, collapsible darkroom comprising a housing formed of two hingedly attached sections opening up to overlie one another on the same plane, with a framework disposed within the housing and extensible therefrom to form, with the housing, a substantially rectangular enclosure, and a light-proof canopy enclosing the framework and housing interior. The housing interior supports a photographic enlarger and baseboard secured to, and vertically adjustable in respect of, a pair of aligned posts, and a series of developing trays removeably supported on the housing interior. Air circulation is provided by a blower and baffled vents, and light by a fixture, both secured to the housing interior and wired, with the enlarger, to a source of electricity outside the darkroom.

7 Claims, 7 Drawing Figures



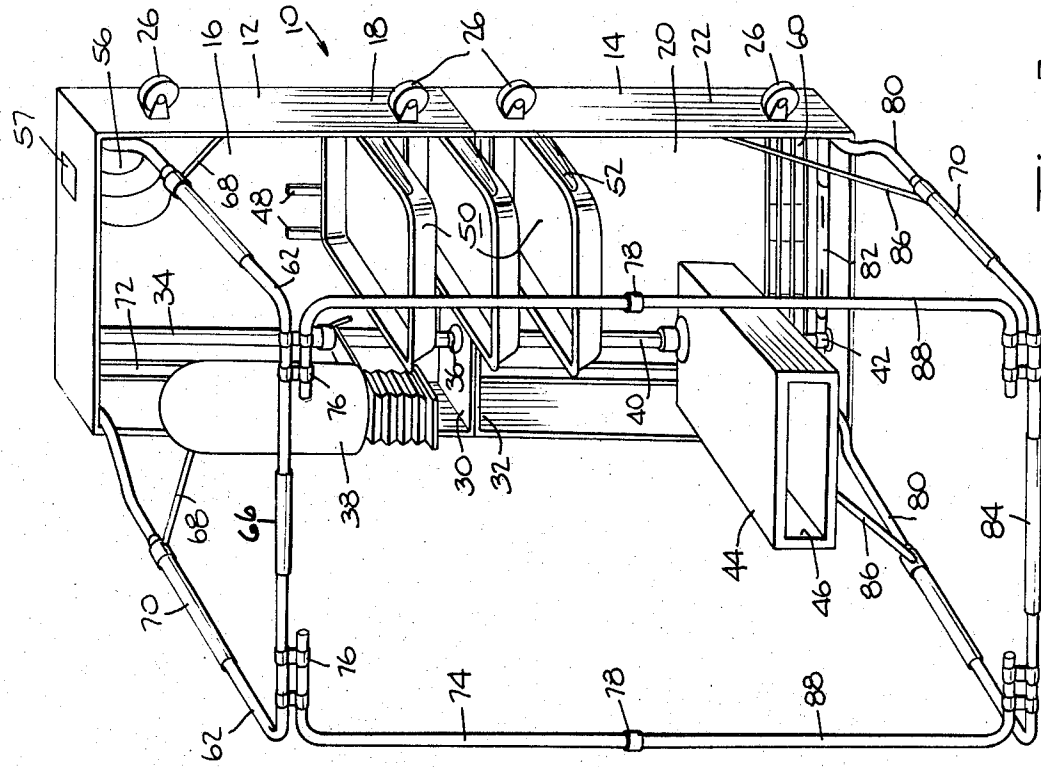

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Fig. 2.

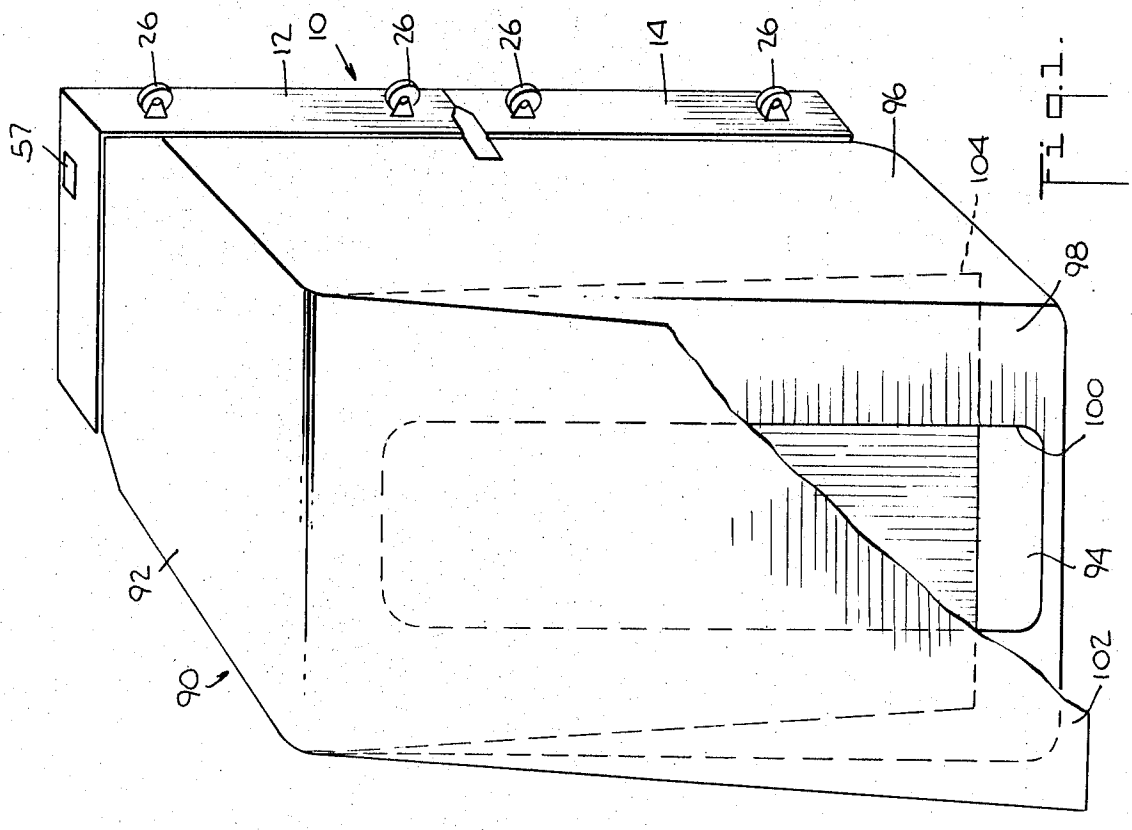

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92
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Fig. 1.

Fig. 3.

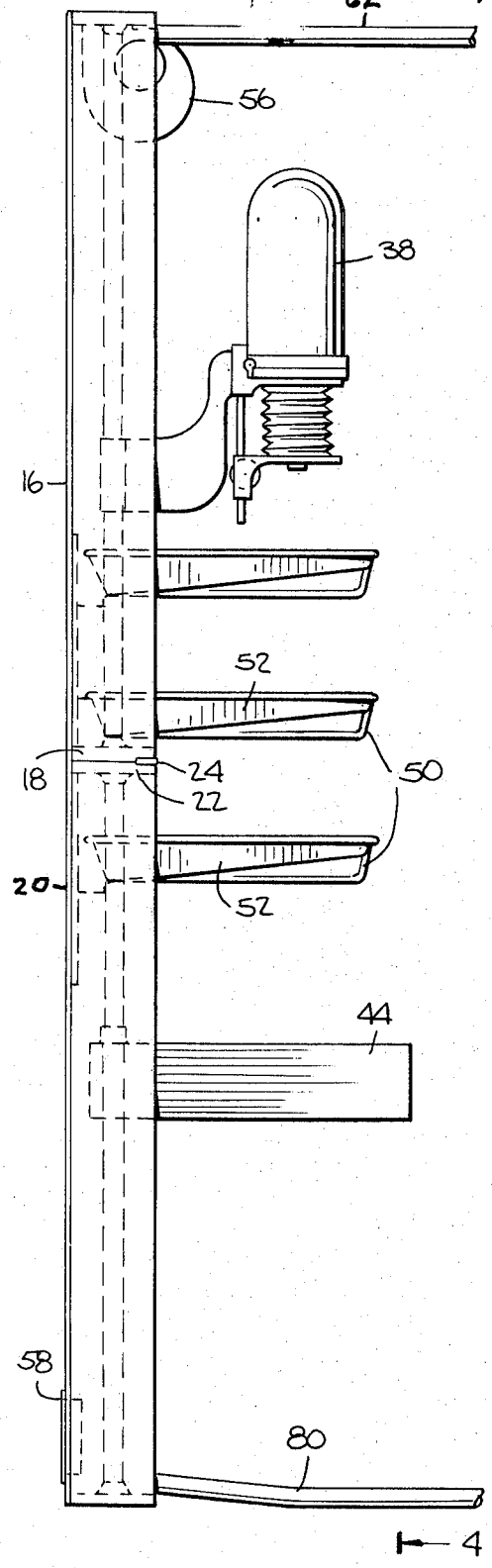
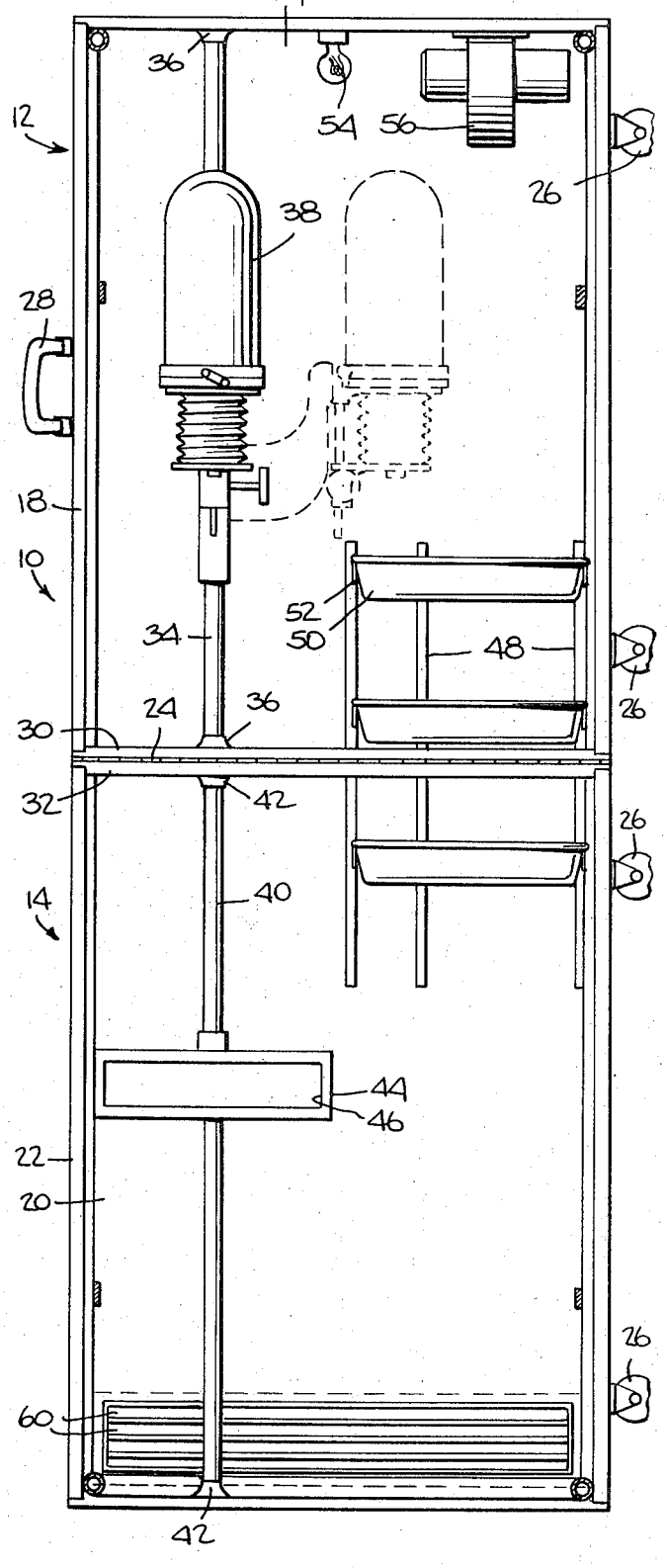

62
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56
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16
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18
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22
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Fig. 4.


16
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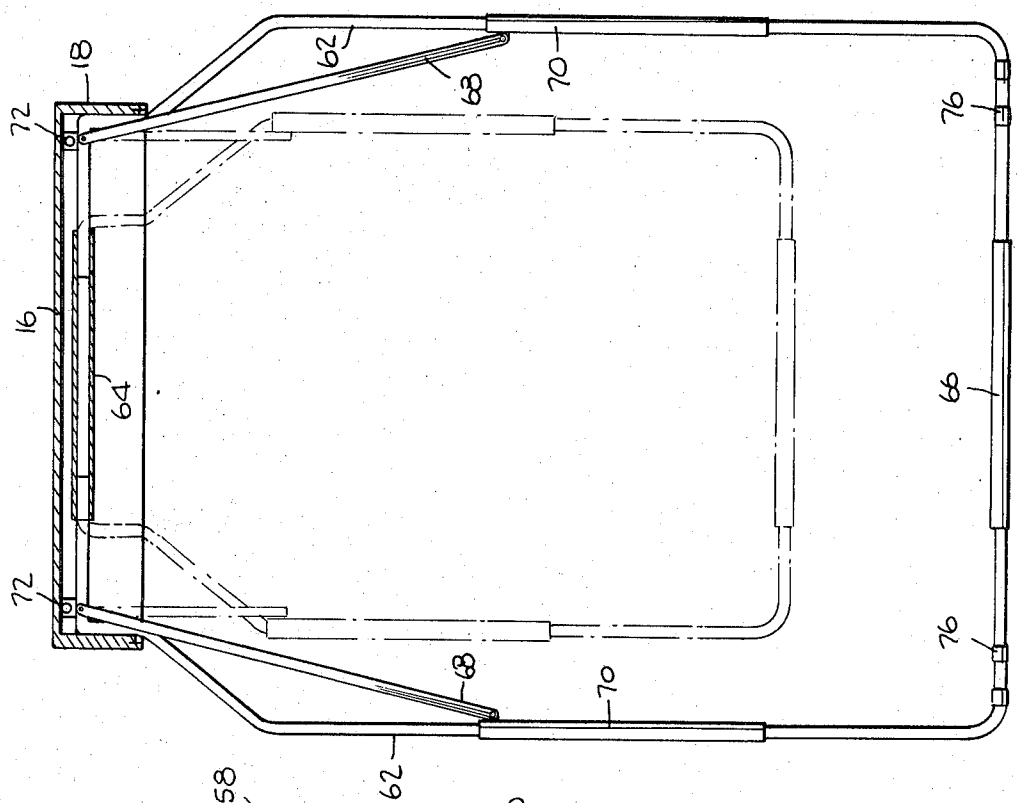


Fig. 7

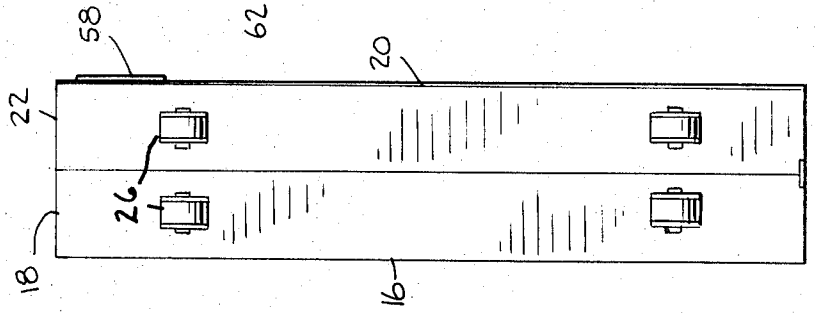


Fig. 6.

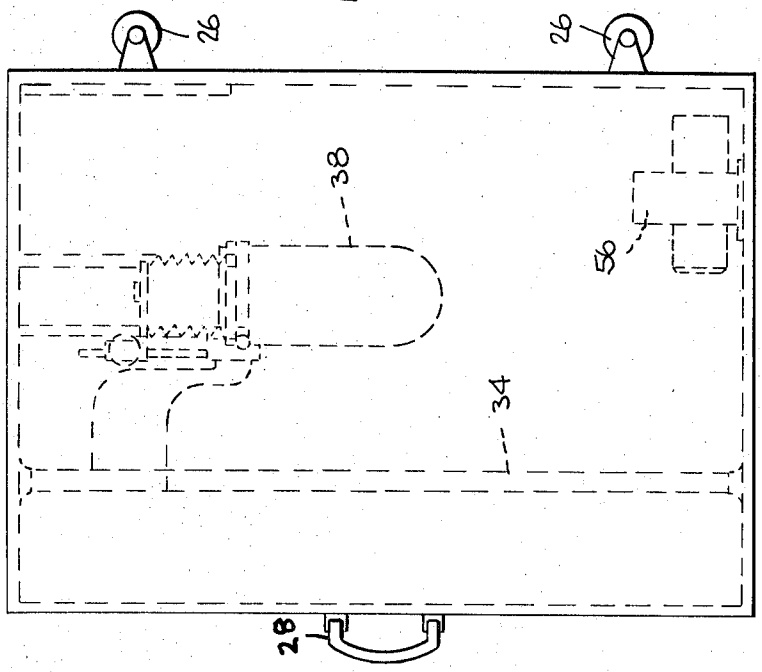


Fig. 5.

PORTABLE COLLAPSIBLE DARKROOM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to the field of photographic development and enlargement, and more particularly to the creation of a portable darkroom for the development of photographic film and the making of prints and enlargements therefrom, which can be collapsed to occupy a small area of space and conveniently stored when not required for use, and which can be set up in any selected area.

2. Prior Art

Photographic film, after initial exposure in a camera, must be developed in a developing medium under conditions which must exclude all light, both in the removal of the film from its container and during the process of development, since any secondary or subsequent exposure of the undeveloped film will either destroy and spoil the effects of the initial exposure in taking the pictures. Similarly, after the film has been developed and fixed as a negative, and prints are desired, either contact or enlarged, the exposure of the negative to a light-sensitive paper must be done in an area where direct light of any kind, other than light from what is known as a "safelight" is completely excluded, except such light as is directed on to the light-sensitive paper through the film negative in the process of exposure. The thus exposed paper is then developed in a paper developing medium under the same conditions. Following development, washing and fixing of the print, it may then be exposed to light without harm.

In the present state of the art the foregoing is generally accomplished in what is termed a darkroom, that is to say, a fixed, enclosed area, generally a room without windows, from which all outside light can be effectively excluded during the procedures described above. Naturally, with the necessity for the required equipment, chemicals, developing and washing trays, paper, etc., a considerable amount of space is required, which has otherwise no function, and it is clearly impractical, for example, for non-professional photographers (whose number has increased greatly in the past few years) to set aside such space for this purpose alone. Even professional photographers, whose work frequently takes them far from their establishments, find themselves hampered by having to delay development of their efforts until they return to their regular darkrooms.

Various efforst have been made in the past to overcome these difficulties by providing some form of temporary structure to enable development and printing of film, other than in such fixed areas particularly set aside for this work, but these structures, for one reason or another, have not been found fully effective, convenient or satisfactory. For example there have been developed portable structures where the photographer must stand outside the structure while his hands are disposed within the structure (see U.S. Pat. Nos. 684,803; 779,748; 2,484,048).).

BRIEF SUMMARY OF THE INVENTION

The disadvantages of the aforementioned structures are clearly overcome by my invention, which provides a portable, collapsible housing to enclose both the photographer and all of his necessary equipment, which is light in weight and which, when collapsed, can be moved easily and stored in a small area, such as a closet or the like, when not in use, and which, when opened and with its interior elements extended, as will be hereinafter described, forms a substantially large and completely light-proof enclosure adapted to contain and support all necessary equipment for film development and printing, as well as provide adequate room within the enclosure for the operator to function freely and comfortably. My invention can be set up in any area accessible to a source of electric current, and can even be used out-of-doors, with battery-provided current.

The principal object of my invention, therefore, lies in the provision of a portable, collapsible dark room, which, in its closed state, can be stored in a small space or area, when not in use, and which, when opened and with its interior elements extended, forms a substantially large and completely light-proof enclosure, completely equipped for film development and printing, and provides adequate room therein for the operator to be conveniently accommodated.

A second important object of my invention lies in the provision of a darkroom as above described wherein the required equipment forms a part of the internal structure of the housing.

A third important object of my invention lies in the provision of a darkroom as above described wherein the required equipment can be disassembled and stored within the housing when it is closed.

A fourth important object of my invention lies in the provision of a darkroom as above described wherein provision is made for complete air circulation therethrough without light exposure of the interior.

Still another important object of my invention lies in the provision of a collapsible darkroom as above described, which is inexpensive to manufacture and which can be quickly and easily assembled and disassembled.

These and other salient objects, advantages and functional features of my invention, together with the novel features of construction, composition and arrangement of parts, will become more readily apparent from an examination of the following specification, taken with the accompanying drawings, wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side perspective view of a preferred embodiment of my invention in assembled position, partly broken away to show internal construction of the canopy;

FIG. 2 is a view similar to FIG. 1, but with the canopy removed;

FIG. 3 is a side view of the interior of the housing of my invention, partly broken away;

FIG. 4 is a front view on lines 4—4 of FIG. 3;

FIG. 5 is a front view of the housing of my invention in disassembled, closed position, showing disposition of the interior elements;

FIG. 6 is an end view of the embodiment of FIG. 5; and

FIG. 7 is an enlarged top view, partly in section, showing the manner of extension of the framework disposed within the housing of my invention.

Similar reference characters designate similar parts throughout the different views.

DETAILED DESCRIPTION OF THE INVENTION

Illustrative of the embodiment shown by the drawings, my portable, collapsible darkroom comprises a housing **10** formed by two substantially rectangular, identically sized sections **12** and **14**, section **12** formed with a base **16**, with a wall **18** extending at right angles therefrom, and section **14** formed with a base **20**, and a wall **22** extending at right angles therefrom, sections **12** and **14** being secured together along shorter sides of walls **18** and **22**, as by piano hinge **24**, as shown in FIG. **4**, and provided with a locking means (not shown) upon their opposing shorter sides, whereby the sections **12** and **14** may be secured together as a housing **10** to define a central chamber thereinbetween. A pair of casters **26** are provided on adjacent longer sides of the walls **18** and **22**, while a handle **28** is provided on the opposing longer sides of walls **18** and **22**, as shown in FIG. **5**, so that the housing **10**, when closed and locked, can be laid on its side carrying the casters **26**, to facilitate easy removal of the housing from place to place, and storage in a convenient closet or the like. The housing **10** is composed, preferably, of a light wood, or metal such as aluminum, but other materials, such as synthetic resins and plastics, may be used as well.

In the preferred form of the invention the housing **10**, when closed, will measure 30 inch × 42 inch, with a depth of 10 inch, so that, when sections **12** and **14** are opened and supported one on top of the other, as seen in FIGS. **2** and **4**, the overall measurement of the open housing **10** will be 30 inch in width, 84 inch, or 7 feet, in height, with a chamber depth of 5 inch, approximately, allowance being made for the thickness of the material forming the housing **10**. These measurements, however, are by no means critical, merely preferable, and the over-all size of the housing **10** may be modified within the scope of functional application.

Referring now to FIGS. **3** and **4**, the interior of section **12** is provided with a post **34** set at one side thereof, supported in sockets **36**, post **34** being removeable by reason of a tension spring (not shown) secured within one of the sockets **36**, as is well known in the art. A photographic enlarger **38** is mounted on the post **34** and secured thereon for rotative and vertical movement by means of a set screw (not shown), whereby the enlarger **38** can be raised or lowered upon the post **34**, and can be rotated to fit within the interior of section **12**. A similar post **40** is provided within section **14** and supported in sockets **42** in manner similar to support of post **34**, both posts being aligned, as shown in FIG. **4**, with post **40** supporting a compartmented baseboard **44**, moveable vertically along post **40** and secureable at any selected height thereon, by operation of a set screw (not shown). Baseboard **44** is provided with a frontal opening **46** in its compartmented portion, through which light-sensitive paper, enclosed in an opaque protective sleeve, may be inserted, for use as will hereinafter be described, and baseboard **44** can be removed from post **40** for storage within the housing, when not in use, by releasing post **40** from its sockets **42**, removing the baseboard **44** therefrom, thereafter replacing post **40**.

On the inner surface of bases **16** and **20** there are provided a series of parallel, vertically disposed slotted members **48** adapted to rigidly support a series of developing trays **50** in spaced relationship, as shown in FIGS. **2**, **3** and **4**, by means of removeable support members **52**, fitting beneath the downwardly curved lips of the trays **50**, engaged within slots of members **48**. To the inner surface of wall **18** of section **12** there is secured a light fixture **54** for retention of a safelight, and an exhaust blower **56** opening into a port **57**, the blower **56**, fixture **54** and enlarger **38** being wired in same circuit engagement by means of an electric cord (not shown) adapted to extend from the interior of the housing **10** to be inserted into the wall outlet of an electric source, or connected to a battery where the formed is not available, the light fixture **54**, blower **56** and enlarger provided locally with separate contact switches (not shown), whereby each can be activated separately, if desired. The lower portion of base **20** of housing section **14** is provided with a series of air vents **58**, covered by baffles **60**, whereby air may be drawn through the housing **10** in the operation of the blower **56**, while excluding entry of light through the vents **58**.

Coming now to the extensible structure of my invention, and referring particularly to FIGS. **2** and **7**, section **12** is provided with a pair of arms **62**, preferably of tubular aluminum, which are slideably and pivotally mounted, at one end, within a sleeve **64** secured to the inner surface of base **16** of section **12**, near the top thereof, as shown, and at the other ends similarly disposed within a secondary sleeve **66**, the arms **64** being so angled near their engagement with the sleeve **64** so as to permit movement of the arms **62** outwardly from the sleeve **64** to their abutment against the wall **18**, as shown in FIG. **7** in solid lines, for enlargement of the area encompassed by the arms **62**, and to permit movement of the arms **62** inwardly within the sleeve **64** to the abutment of the arms **62** against the edges of the sleeve **64**, as shown by the broken lines of FIG. **7**, the arms **62** moving reciprocally with respect to the sleeve **66** so as to maintain the arms **62** parallel to each other at all times. Rotating of the arms **62** out of the housing **10** is facilitated and controlled by a pair of guide members **68**, with each secured at one end to a sleeve **70** mounted on an arm **62**, and with its other end disposed within a channel **72** in the base **16**, the length of the channels **72** being such as to limit pivotal movement of the arms **62** to a position at right angles to the base **16**, as shown in FIG. **2**

Each of the arms **62** is provided with a support rod **74** pivotally secured thereto by links **76**, and rotatable with respect to the arm **62** from a position parallel thereto to a position at right angles thereto as seen in FIG. **2**, with the free ends of the rods **76** threaded, and each with a coupling **78** mounted thereon, for the purposes to be hereinafter disclosed.

The interior of housing section **14** is provided with an identical pair of parallel arms **80** disposed within sleeves **82** and **84** identical to sleeves **64** and **66** heretofore described, sleeve **82** being secured to and near the bottom of the base **20**, the arms **80** being moveable and pivotal in the same manner, and controlled in the same manner by guide members **68** secured to sleeves **70** and within channels **72**. Each of the arms **80** is similarly provided with a support rod **88** pivotally secured thereto by links **76** and rotatable from a position parallel to its arm **80** to a position at right angles thereto, with the end of each rod **88** threaded in the same manner as rods **74**. With the extension of arms **62** and **80** at right angles to the housing bases **16** and **20**, and with the disposition of their respective support rods **74** and

78 at right angles to their respective arms 62 and 80, the ends of rods 74 and 88 will contact in alignment, whereby the couplings 78 on rods 74 can be threaded to rods 88 to lock the respective rods 74 and 88 together, thereby creating a rigid, substantially rectangular framework connected to and extending out of the housing 10, as shown by FIG. 2. It is here to be noted that the arms 80 are curved, as shown in FIGS. 2 and 3, so that the main portions of the arms 80 rest on the same plane as the outer surface of wall 22, thereby providing horizontal stability and rigidity to the assembled darkroom.

Referring now to FIG. 1, there is provided, in combination with the aforementioned structures, a canopy 90 adapted to completely enclose the interior of the housing 10 and the extending framework, the canopy 90 composed of a sturdy light-weight and light-proof material soft enough to be folded, when not in use, to be disposed within the interior of the closed housing 10. Canopy 90 is formed to fit snugly around the previously described framework of arms 62 and 80, and co-acting rods 74 and 88, and adapted to have its free edge fit into the housing 10, the free edge of the canopy 90 being provided with a plurality of suitable snap members (not shown) adapted to come into registry with and be engaged by complementary snap retainers (not shown) mounted along the inner surfaces of walls 18 and 22, so that the canopy 90 is sufficiently embraced within the housing 10 to exclude all ambient light. Canopy 90 comprises a top wall 92, bottom wall 94, side walls 96 and front wall 98, the latter provided with a central opening 100, for entrance into the interior therethrough. Canopy 90 is further provided with an exterior flap 102 and an interior flap 104 covering front wall 98 and opening 100, secured to the canopy 90 along the top edge of front wall 98, so that one of the flaps 102 and 104 covers the opening 100 at all times of egress from and ingress into the enclosure provided.

OPERATION OF THE INVENTION

In the collapsed and stored state of my portable darkroom the sections 12 and 14 are locked together, with the interior chamber thereof containing all of the equipment heretofore described, that is to say, the enlarger 38 has been pivotted to the position shown by the broken lines in FIG. 4, the trays 50 have been disassembled and nested in one another, with support members 52, baseboard 44 has been removed from post 40 and disposed within the chamber, and canopy 90 has been folded and overlaid upon the aforementioned equipment.

When the darkroom is required for use for, let us say, enlargements prints of negatives, the housing 10 is wheeled to the desired area and opened, and the stored equipment removed therefrom. Housing 10 is then turned and raised to stand upon the free shorter side of wall 22 of section 14, and section 12 is lifted to rest upon section 14 with their respective walls 18 and 22 in abutment to form a shelf, as seen in FIG. 2. Arms 80 are extended at right angles to base 20 and arms 62 extended at right angles to base 18, with arms 62 and 80 spread apart as heretofore indicated, and the support rods 74 dropping vertically. Support rods 88 are individually raised to meet the ends of respective support rods 74, and couplings 78 are tightly threaded to the rods 88, whereby a rigid support framework is created to support the housing 10 in a stable vertical position. Post 40 is removed for installation thereon of baseboard 44, and replaced. Enlarger 38 is pivoted to overlie the baseboard 44. Canopy 90 is then slipped around the framework and secured to the interior of walls 18 and 22 of the housing 10. Tray supports 52 are mounted in the slotted members 48. Trays 50 are filled, respectively, with developer solution, water and fixitive solution, and mounted on the supports 52. The exhaust blower 56, safelight 54 and enlarger 38 are then connected to an appropriate source of electric power, and the darkroom is ready for operation. Disassembly and storage of the darkroom is accomplished by reversing the above steps.

The foregoing disclosure describes only a preferred embodiment of my invention. It is apparent that various changes may be made within its scope. For example, posts 34 and 40 may be modified to accommodate different types of photographic enlargers, the canopy 90 may be modified in its attachment to the housing 10, the framework may be modified, both as to material composition and extension elements, the framework may be automated, and suitable cubicles provided within the housing 10 for storage of chemicals, tongs, etc.

From the foregoing, therefore, it is obvious that the embodiment shown and described is by way of illustration and not of limitation, and that various changes may be made in the construction, composition and arrangement of parts without limitation upon or departure from the spirit and scope of the invention, or sacrificing any of the advantages thereof inherent therein, all of which are herein claimed.

Having described my invention, I claim:

1. A portable collapsible darkroom comprising a housing formed of a pair of substantially rectangular sections of identical size and shape comprising each a base and a surrounding wall extending at right angles from the base, the sections disposed, when secured together in closed position, to define an internal chamber for the housing, a hinge pivotally securing the sections together along abutting wall edges, the sections adapted, when fully opened, to stand one atop the other in the same plane to form the housing, a framework secured to and recessed within each of the sections in collapsed state and extensible therefrom to form, with the opened sections of the housing, and define therewith, a rigid room-sized enclosure, and a light-proof canopy removeably secured around the framework and the housing interior to define a darkroom.

2. A portable, collapsible darkroom as described in claim 1, a post secured in each of the sections, a photographic enlarger slideably and rotatively mounted on one of the posts, with means to activate the enlarger extending from the housing, a baseboard slideably mounted on the second post and in alignment with the enlarger, a plurality of developing trays and means within the housing to support the trays in spaced relationship to each other.

3. A portable, collapsible darkroom as described in claim 2, an exhaust blower secured in one end of the housing and air vents provided at the other end of the housing, a port in the housing wall in registry with the blower, and means to activate the blower extending from the housing.

4. A portable, collapsible darkroom as described in claim 3, baffles provided over the air vents to exclude light from entering through the air vents.

5. A portable, collapsible darkroom as described in claim 4, a safelight provided in the housing wall, with means to activate the safelight extending from the housing.

6. A portable, collapsible darkroom as described in claim 5, casters provided on the outer surfaces of adjoining walls of the housing, and a handle secured to the outer surfaces of opposing walls of the housing.

7. A portable, collapsible darkroom, as described in claim 5, the means to activate the enlarger, exhaust blower and safelight being on the same circuit, with individual activating switches for each.

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