Aug. 14, 1945. A. S. CAMERON 2,382,131

FOOT VISUALIZER

Filed Aug. 13, 1943 2 Sheets-Sheet 1

FIG. 1.

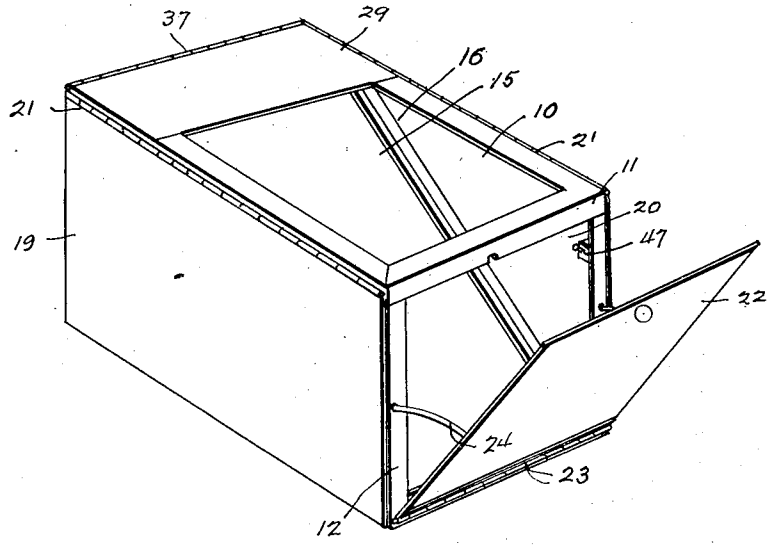
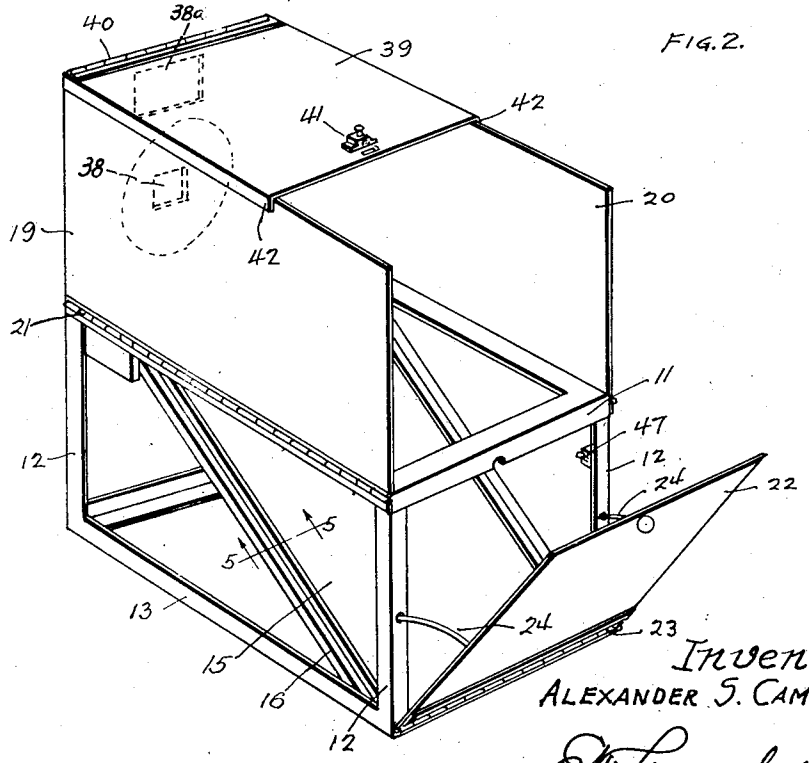


FIG. 2.



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FIG. 3.

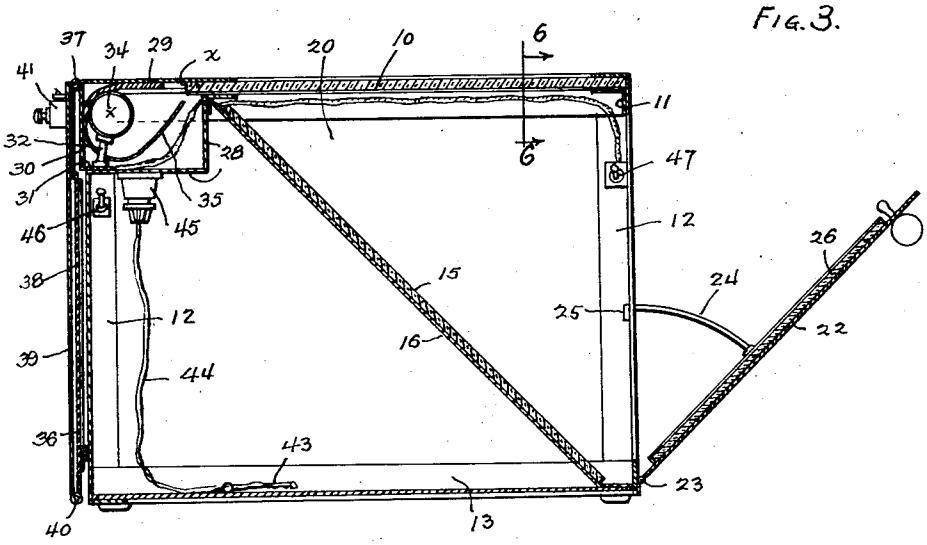
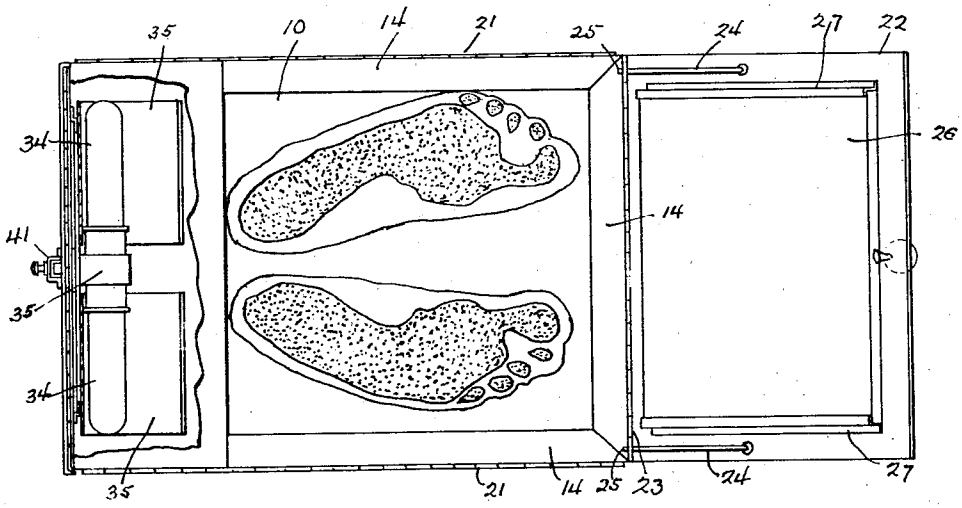


FIG. 4.



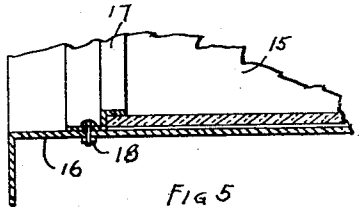


FIG 5

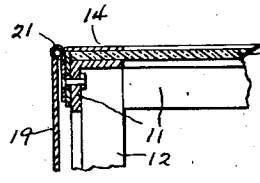


FIG 6

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UNITED STATES PATENT OFFICE

2,382,131

FOOT VISUALIZER

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Application August 13, 1943, Serial No. 498,495

3 Claims. (Cl. 88—74)

My present invention relates to a visualizer or viewing apparatus and especially a device which permits the viewing of the bottom of a person's feet when the individual is in a standing position and supporting the weight of the body upon the feet. By means of this apparatus the areas of contact of the feet are clearly disclosed, as well as the distribution of weight upon each foot. The arrangement of the parts of the apparatus are such that the entire bottom of each foot may be observed by the physician or attendant making an examination and these portions of the feet may also be seen by the patient himself merely by directing his sight in a downward direction while standing upon the apparatus. This permits the physician to readily diagnose ailments and imperfections or abnormalities which may be present and at the same time he may demonstrate to the patient the extent of these abnormalities or defects.

The structure embodies a translucent plate upon which the person stands, below which there is an oblique mirror which reflects the image of the foot in a manner that permits it to be viewed from outside the frame, and there is a second mirror which is disposed in an inclined plane so that the foot images are reflected by the second mirror in a vertical or upward direction towards the patient's eyes. In order to accentuate the points of contact of the feet upon the plate I have provided means whereby illumination may be transmitted longitudinally through the plate between the upper and lower surfaces thereof so that the light rays are substantially parallel to the faces of the plate for producing luminescent representations of the feet which accentuates the contacting portions of the feet to such a degree that said contacting portions stand out boldly as compared to the non-contacting portions of the feet. Aside from being quite well adapted for the purposes desired, this mode of illumination possesses the advantage that it effectively prevents illumination or disclosure of the ankles or other portions of the person's limbs nor are extraneous objects reflected by the mirrors, such as when the light rays from the illuminating source are either reflected or directed upwardly towards the bottom of the foot. Furthermore, thermal units from the light source moving in the direction of the light rays through the glass plate, will heat the latter by heat conduction.

I have provided means for readily converting the structure into a miniature "dark-room" wherein the patient may insert his foot to permit the physician or attendant to make a further examination of the foot by means of a trans-illuminating device. The walls of the structure are hinged so that they are readily foldable into positions whereby they provide a rectangular box-shaped structure for storage.

The arrangement of the parts of my visualizer apparatus is quite compact so that it occupies a relatively small space and it is made in such manner that it may be quickly converted into a miniature "dark-room" without the use of tools. In its performance my apparatus is efficient, and it is sturdily built so that it will stand severe usage. Another advantage of my apparatus is that the physician may readily and graphically demonstrate to the patient such defects and abnormalities as he may find in examining the foot. Furthermore, the apparatus is economical to manufacture and it may therefore be sold at a reasonable retail price.

The numerous objects and advantages of my apparatus will be apparent to persons skilled in the art after the construction and operation thereof is understood, and I prefer to practice my invention in the manner hereinafter explained. The accompanying drawings are referred to for a better understanding of my invention, and these drawings, while of somewhat schematic form, disclose the principles of my visualizer and a typical manner in which the apparatus may be made.

In the drawings:

Figure 1 is a view in perspective of my foot visualizer.

Figure 2 is a perspective similar to Figure 1 showing the apparatus converted into a miniature "dark-room."

Figure 3 is a vertical longitudinal section of the structure shown in Figure 1.

Figure 4 is a plan of my apparatus with a portion of the top wall of the lamp house broken away.

Figure 5 is a transverse vertical section on line 5—5 of Figure 2.

Figure 6 is a vertical section on line 6—6 of Figure 3.

My foot visualizer embodies a flat translucent member 10, preferably of heavy plate-glass, that provides a surface upon which the patient is adapted to stand, and said plate is supported horizontally in the upper portion of a skeleton framework made of angle-iron or the like. The horizontal angle-members 11 provide a rectangular frame, the corners of which are supported by vertical angle-members 12 which provide

standards to dispose the glass plate 10 a suitable distance above the floor. In order to strengthen and reinforce the framework, horizontally angle-members 13 connect the lower portions of the standards 12. The glass plate 10 is maintained in position along its marginal portions by retaining pieces 14 which are of angular cross-section and provide a finishing edge around the margin of the frame 11.

An obliquely disposed mirror 15 is mounted on an inclined transverse supporting plate 16 which disposes it at an angle of 45° to the plane of the glass plate 10 and the mirror is held in position by longitudinally extended Z-shaped strips 17 that are removably secured to the supporting plate 16 by screws 18 or the like. The lower edge of the mirror 15 is adjacent what may be termed the front or viewing end of the apparatus, which is shown at the right hand end of the apparatus in the drawings. The other or upper end of the mirror is disposed close to the adjacent portion of the glass plate 10 but it is spaced a farther distance from the rear end of the frame to provide space at the rear end for a suitable lamp house. Longitudinally disposed side walls 19 and 20 are connected to upper edges of the adjacent margins of the apparatus by elongated piano-hinges 21 which permit these walls to be swung upwardly when desired to the positions shown in Figure 2, the purpose of which will be later described.

At the front end of the apparatus there is an end wall 22 that is connected at its lower edge by an elongated hinge 23 to the bottom portion of the adjacent end of the apparatus thus providing a hinged door that may be swung outwardly at its upper edge. Curved guide rods 24 anchored to the side portions of the door 22 operate in suitable holes in the adjacent uprights or posts 12 when the door is moved and they have their inner ends bent laterally to provide stops 25 which limit the outward swing of the door. When the door has been opened to its fullest extent it will be disposed in a plane substantially at a right angle to the plane of the mirror 15. The inner face of the door has a mirror 26 secured to it by elongated Z-shaped strips 27. In the position just described (with the door opened) the mirror 26 is adapted to reflect the images of the feet, which are received from the mirror 15, in an upward or vertical direction.

The lamp house hereinbefore mentioned embodies angular walls 28 one of which is vertical and extends downward across the back of the upper edge of mirror supporting plate 16, and the other wall extends horizontally towards the end of the frame and is secured to the upper portions of the posts or supports 12 at the rear of the apparatus. A top wall plate 29 extends across the adjacent rear portion of the glass plate 10 and projects to the rear of the frame where it is provided with a down-turned portion 30 having a lateral flange 31 to rest upon the adjacent portion of the horizontal wall of the lamp house above mentioned. There is a stud 32 extending upwardly from the flange 31 to support a double electric socket 33 carrying elongated tubular lamps 34.

As will be seen in Figure 3 the rear edge x of the glass plate 10 terminates at the edge of or between the corners of the lamp house walls. A curved reflecting device 35 surrounds the tubular lamps 34, as seen in Figure 3, and said device is disposed so that its edges, which are spaced apart a slight distance, are close to the rear edge x of the glass plate. The reflected rays as well as the direct rays from the lamps are thus concentrated to impinge upon the rear edge of the glass plate so that the light rays travel longitudinally through the glass plate substantially parallel with the upper and lower surfaces thereof with the result that only a very small proportion of the light rays emerge laterally through the plate. Thus when the person is standing upon the plate 10 the contacting portions of the bottom of the feet have a luminescent appearance and stand out sharply against the flesh or natural color of the remaining or non-contacting portions of the feet. The images of the feet and the fluorescent contacting portions may be observed by the physician or attendant in the mirror 15. If desired, the attendant may have the patient look downward into the mirror 26 where the patient will observe the images of his feet which have been reflected to this mirror by the mirror 15.

The radiant heat from the lamps 34, passing through the elongated slit between the edges of the reflector 35, will impinge upon the adjacent end of the glass plate 10 and this heat will travel with the light rays through the plate 10 so that the glass is heated by the convective travel of the thermal units. In this manner the temperature of the glass plate is raised so that the patient will not be required to stand upon a cold plate but upon one which is of approximately body temperature.

The means for closing the rear portion of the apparatus embodies a vertical wall 36 having a piano-hinge 37 connecting it with the upper rear end of the frame and it is provided with a large central opening that is closed by an elastic or flexible diaphragm 38 having a normally closed slitted entrance opening. A supplementary or secondary wall 39 is foldably connected by a piano-hinge 40 to the lower edge of wall 36 and said secondary wall 39 has its upper free portion connected, by a suitable retainer or latch 41, with the upper portion of the rear wall 36. When it is desired to convert the apparatus into a miniature "dark-room," side walls 19 and 20 are swung to the positions shown in Figure 2, after which the latch 41 is released and walls 36 and 39 swung upwardly so that the wall 36 extends between the adjacent rear edges of walls 19 and 20 while the secondary wall 39 provides the top closure or ceiling of the "dark-room," the respective walls being maintained in position by longitudinal flanges 42 along the edges of wall 39 which engage with the top margins of the side walls 19 and 20 as shown in Figure 2. When used in this manner the door 22 is preferably closed and the lamps 34 extinguished to prevent extraneous light entering the "dark-room." The patient inserts one foot through the diaphragm 38 and the physician may then carefully examine the foot by a transilluminating lamp 43 that is connected to the end of an elongated conductor cord 44 leading from a socket element 45 on the exterior of the bottom wall of the lamp house, the current being controlled through a convenient snap switch 46. The patient may observe his foot during this transillumination inspection through the window 38a in the back wall 36 above the slitted diaphragm 38. The current to the lamps is controlled through a snap switch 47 on one of the front standards 12 convenient to the attendant and the electric conductor leads from this snap switch along the frame under the margin of the

glass plate 10 to the two-way socket 33 in the lamp house.

This apparatus is well-adapted for quickly making of an accurate chart or case-record of a patient's feet to permit a permanent record being kept for future reference by the physician. Prior to the patient standing upon the glass plate a coating of talcum powder is applied to the entire bottoms of both feet. As soon as the person stands upright upon the apparatus an outline of each foot is marked on the glass plate with a suitable pencil, chalk, or the like, and later, when the feet have been lifted from the plate the contact areas thereof will appear upon the top surface of the plate due to adherence of the powder to the glass. The physician or attendant then positions on the glass a graph-sheet of thin paper or other translucent material upon which he traces the outlines of the feet and their contact areas with a lead-pencil, pen, or other stylus. By this means a permanent record may be kept which clearly shows the distribution of the body weight upon each foot, as well as defects or abnormalities which may be found by the physician's examination and diagnosis. Any sterilizing agent or germicidal may be used to wipe the surface of the glass after use by a patient to render it suitable for the next person.

What I claim is:

1. Apparatus of the kind described embodying a box-shaped supporting frame having fixed top and bottom walls; vertical rear and side-walls; hinges at the upper edges of said rear and side-walls adapting them to be moved to vertical positions above said frame; a supplementary wall normally parallel with said rear wall; and a hinge connecting the normally lower edges of said rear and supplementary walls, said hinge adapting said supplementary wall to be extended to provide a cover for said rear and side-walls when the latter are moved to vertical positions above said frame.

2. Apparatus of the kind described embodying a box-shaped supporting frame having fixed top and bottom walls; vertical rear and side-walls; hinges at the upper edges of said rear and side-walls adapting them to be moved to vertical positions above said frame; a supplementary wall normally parallel with said rear wall; a hinge connecting the normally lower edges of said rear and supplementary walls, said hinge adapting said supplementary wall to be extended to provide a cover for said rear and side-walls when the latter are moved to vertical positions above said frame; said rear wall provided with an opening of substantial dimensions; and a flexible slitted diaphragm extending across said rear wall opening.

3. A foot visualizer comprising top and bottom open frames; upstanding posts vertically spacing said frames to provide an open box-shaped support; a translucent plate closing the upper frame and affording a foot support for a person standing thereon; an electric lamp at an edge of said translucent plate for producing luminescent representations of the soles of the feet; vertical walls closing the rear and sides of said box-shaped support, said walls having swinging connections between their upper edges and the rear and sides of said top frame whereby said walls may be moved from their normal closure positions to vertical positions extending above the translucent plate; a slitted diaphragm closing an opening in the rear wall; a secondary wall hinged to the normally lower edge of said rear wall, and adapted to be disposed upon the side walls when the latter are moved to their upstanding positions above the translucent plate for providing a closure; a mirror within said support beneath said translucent plate for reflecting through the front support the images received from said translucent plate; and an oblique mirror outside said support adapted to reflect in an upward direction the images reflected out of the support by the first mirror, said oblique outside mirror being hinged at its lower edge to said bottom frame for swinging movement towards said support to close the front end thereof.

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