

Nov. 8, 1955

G. DEMPSTER

2,722,692

ANATOMICAL SUPPORT FRAME

Filed June 30, 1952

2 Sheets-Sheet 1

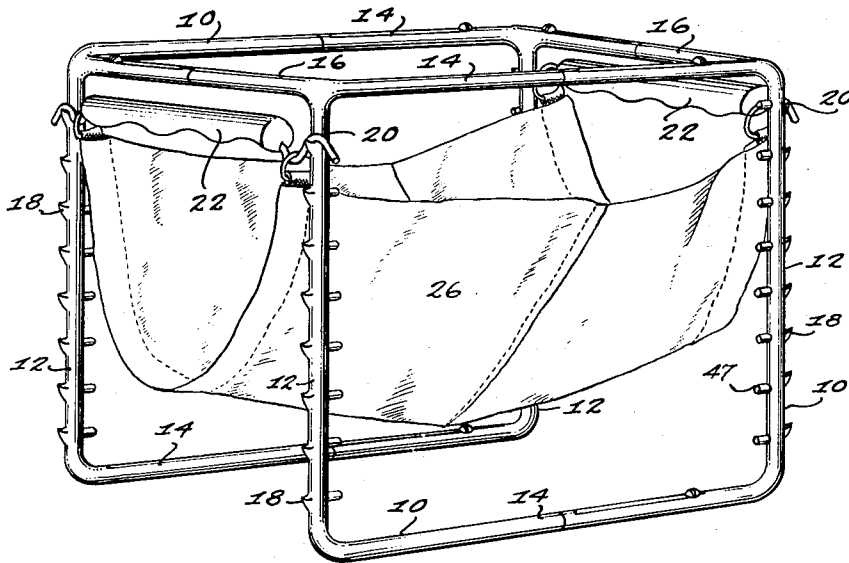


Fig. 1

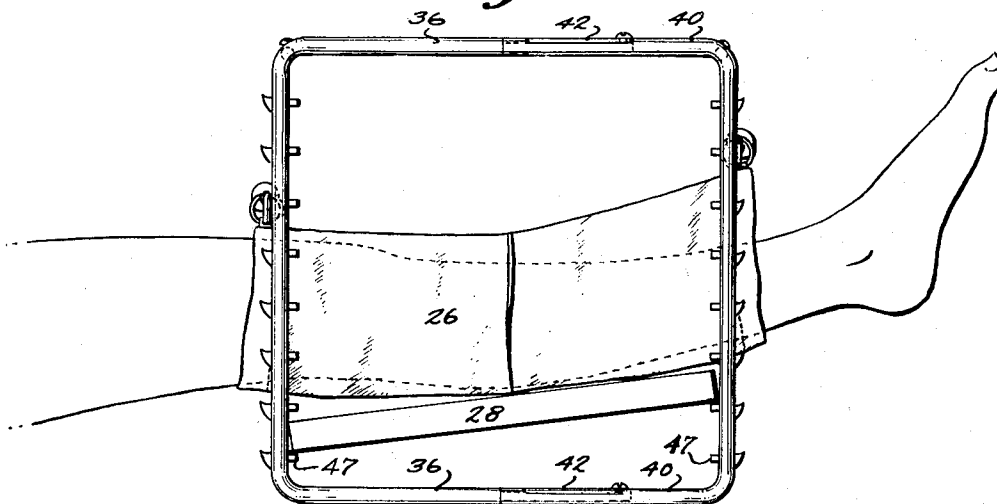


Fig. 2

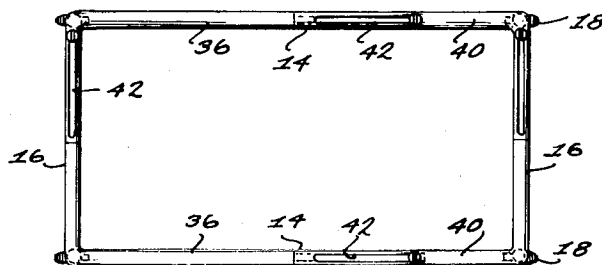


Fig. 6

Hetchen Dempster

INVENTOR

Nov. 8, 1955

G. DEMPSTER
ANATOMICAL SUPPORT FRAME

2,722,692

Filed June 30, 1952

2 Sheets-Sheet 2

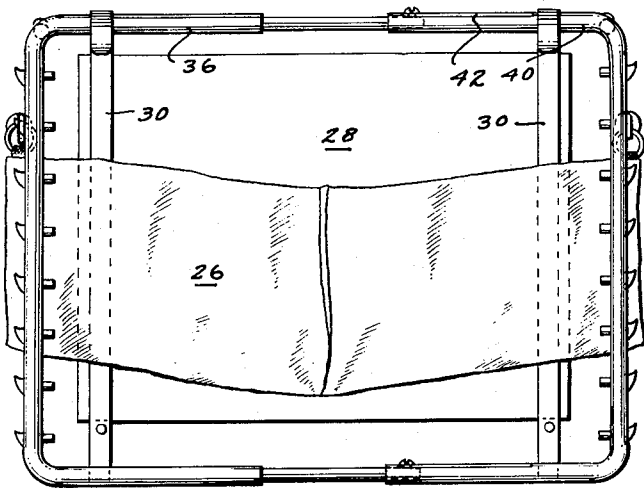


Fig. 3

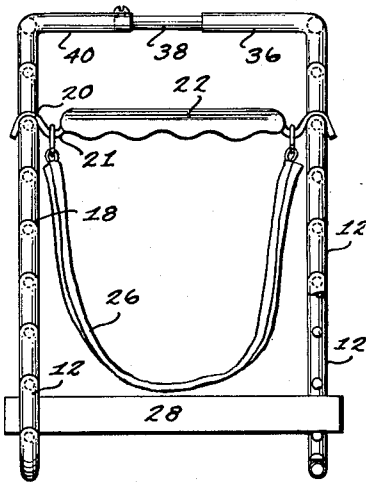


Fig. 4

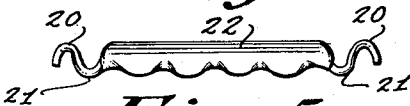


Fig. 5

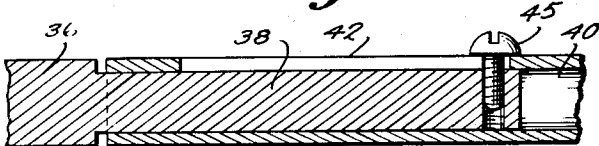


Fig. 8

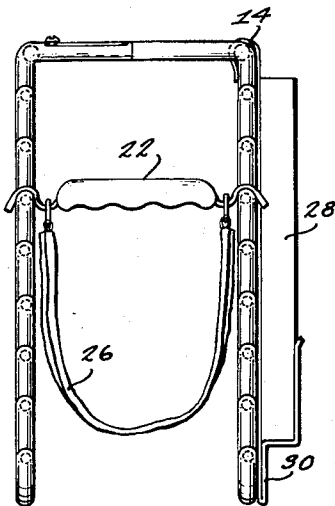


Fig. 10

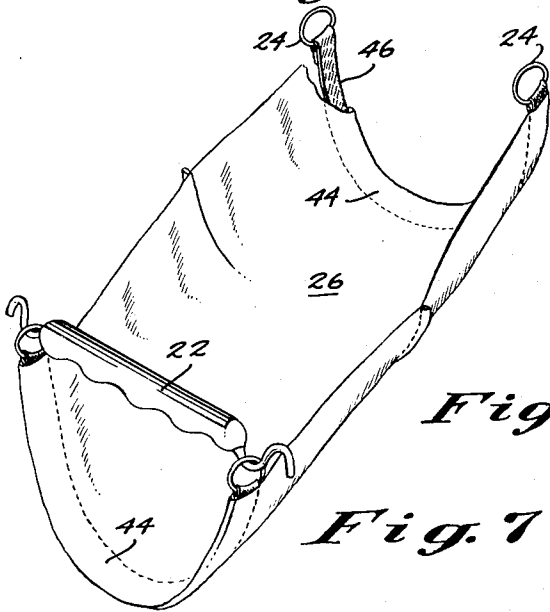
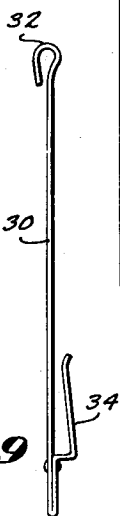


Fig. 7

Fig. 9



INVENTOR

Gretchen Dempster

1

2,722,692

ANATOMICAL SUPPORT FRAME

Gretchen Dempster, Colorado Springs, Colo.

Application June 30, 1952, Serial No. 296,350

5 Claims. (Cl. 5—327)

2

In X-ray techniques one of the most aggravating annoyances is the X-raying of broken bones which have been recently set and placed in a cast. When a cast is fresh the pressure of one's hand or fingers leaves a small dent in the cast and thus transfers pressure to the part of the anatomy the cast is on, forming a bruise. The case must generally be handled by several technicians with extreme care in order to get all X-rays required. Then several hours or days later the same routine must be followed to get follow up shots on the progress of the knitting of the break.

Many times the pain of a break is intense and any handling is very risky to avoid additional breakage or increased pain.

My invention relates to a method of support of any part of a body for X-ray purposes or cast drying so that it need not be moved.

An important object of my invention is to provide an improved method of supporting injured parts of a body by means of a portable device unattached to any bed, table or other piece of equipment which fact increases its usefulness and service manifold. It is easily moved to its place of service and functions independent of any other device.

A further object provides a simple method of raising and holding in any given position an injured appendage to be X-rayed.

Still another object is a means of supporting a freshly casted arm or leg or back or neck so that it may be X-rayed in all positions as it dries and not be touched.

Another object is to provide a method of supporting members or the whole of a body in a comfortable position.

In the accompanying drawings forming a part of this specification like numerals are used to designate similar parts.

Figure 1 shows a perspective view of my invention with the supporting hammock in its raised position.

Figure 2 shows a side view of my invention, in closed position, with the supporting hammock in an inclined position.

Figure 3 is the same as Figure 2 except the hammock is in the horizontal position and the frame is in open position.

Figure 4 is an end view of my invention in closed position showing lifting handle in its raised position.

Figure 5 is a side view of lifting handle showing hammock supporting loops and the position supports engaging hooks.

Figure 6 is a top view of my invention in the closed position.

Figure 7 is the supporting hammock with one lifting handle in position.

Figure 8 is a cross-section of one portion of the supporting frame showing one method of adjusting for various sizes of X-ray plates.

Figure 9 is an X-ray plate holder.

Figure 10 is an end view of supporting frame with plate holder and plate in position.

In the drawings wherein is shown a preferred embodiment of my invention Figure 1 indicates a rigid frame which has four upright legs 12. The upper and lower ends of legs 12 are connected by two long rigid connectors 14 and two short connectors 16. The purpose of this arrangement will be disclosed later. On each leg 12 are small triangular shaped rests 18 which may be made as an integral part of leg 12 in its manufacture or attached later. These rests should be approximately one inch apart for maximum efficiency. The outer extensions 20 on the handle 22 fit on these rests 18 and as the handle 22 is raised into position it will easily slide up over the outwardly beveled bottom sides of the rests 18 and come to rest on the flat upper sides. The inner part of the extension 20 on the handle 22 holds in position the rings 24 Figure 7 which are attached to the flexible container 26. The position of the hammock 26 in relation to the legs 12 and the use of the handle 22 is shown clearly in Fig. 4. The extensions 20 of the handle 22 have engaged the rests 18 and the rings 24 of the hammock 26 are seen extending down from the inner loop 21. In Fig. 1 the hammock 26 is shown in its upper position, and the rigid connecting arms 14 and 16 are shown in closed position.

In use the hammock 26 is very carefully placed under a patient's arm, leg, head, or back, or any injured part of his body. For purposes of simplification we will discuss the use of my invention in relation to a broken leg, but I am in no way limiting this device to that use as will be brought out later. The two outer edges containing the rings 24, as is clearly shown in Fig. 7 are brought up on each side of the injured leg and the handle 22 is hooked into the rings. One handle 22 is placed in each set of rings. If, as is indicated in Fig. 2 the patient is in a reclining position, the leg can be raised by one person using the handles 22 to an inclined position that is comfortable for the patient. At this time an X-ray plate 28, Fig. 4, of appropriate size is inserted directly below the hammock 26 and a vertical shot is made. The X-ray plate 28 rests on a short pin 47, Fig. 1, of which several are positioned along the inside of the leg 12. These pins 47 are placed the proper distance apart so that a standard size X-ray plate may be inserted flat or inclined and not be hard to handle.

Without touching the patient's leg a side shot can be made for the same break without touching the cast by the use of the X-ray plate holders 30 as shown in detail in Fig. 9 and in use in Fig. 10. These holders 30 have a curved and hooked upper portion 32 which fits over the bar 14. At their lower end is a hooked portion 34 which holds the X-ray plate holder 28. When the curved part 34 is hung over the side support 14 the X-ray plate holder 28 then hangs down behind the patient's leg and a side view may be shot. The side view of this arrangement is shown in Fig. 3.

If after the first X-rays the cast is not dry the leg can be left in the hammock which being given even support will cause very little discomfort and by being made of a porous material such as canvas will allow air to surround the cast to speed drying. This method of drying seems far superior to the rubber covered pillow method in use now.

Two standard size X-ray plates in use today are 14 x 17 and 10 x 12. The operation of this invention will be discussed for each size plate. These plates are the typical ones used in making shots for arms, legs, and smaller localized breaks. The size of my invention is not limited to these two standard X-ray plates but for purposes of simplification I will discuss its use with these plates. In its closed position as shown in Figs. 1, 2, 6, and 10 the X-ray plate size 10 x 12 would fit perfectly. If a larger limb was encountered the small film would not adequately cover the subject. Or as in common practice due to

the expense of X-ray plates, half of the plate is leaded off during one shot and the other half is leaded off during the other thus getting both pictures on one plate. In this latter case the larger 14 x 17 plate is generally employed. This position is shown in Figs. 3 and 4.

The method of expansion of the framework is shown in Fig. 8. One end 36 of the arm 14 and 16 has a section 38 which is of smaller diameter than the arm 14 itself. The other end 40 is hollowed out and has a slot 42 cut into its upper side, this is clearly shown in Fig. 6. A screw 45 or similar locking device Figure 8, is firmly attached to the end of the rod 38 and extends into the slot 42. The large head of the screw 45 will not permit the rod 38 to be extracted from the hollow portion 40. In the present case the slots in the arms 14 Figure 1 are five inches long and in the arms 16 are four inches long thus allowing for expansion from a 10 x 12 size to a 14 x 17 size. This arrangement, although simple, eliminates anyone from accidentally pulling the frame apart when a patient's appendage is in the hammock.

When using the frame 10 Fig. 1 in its open position a longer set of handles 22 and a larger hammock 26 must be used to fit the new size frame. They would be of exactly the same type as described but larger in size.

The rigid frame 10 is formed of cast aluminum or some similar light metal for the smaller versions of this invention and of more sturdy construction as the size increases. The most important considerations are ease of handling and enough strength to support the most load it will encounter.

The handles 22 are shaped of a similar metal with a hard curved section 20 extending from each end. These handles 22 must be formed to fit the hand of the average X-ray technician for when one has a large patient and is attempting to lift his leg with a cast on it into the frame the better the handle fits the hand the easier the lifting. The extensions 20 must be firmly attached to the handle 22 and be sturdy enough to support a great deal of weight.

The hammock 26 can be formed of canvas. The length must be enough so that when the inclined position is used there is enough canvas to stretch from one handle to the next. The end of the canvas contains large hems 44 Fig. 7 into which are placed heavy canvas straps 46 that have the rings 24 attached to each end.

In field hospitals in the army many times men who have been wounded by shrapnel are brought in on litters. At present these men are carefully but painfully transferred to X-ray tables where they must be rolled from one side to the other to be X-rayed before surgery, in order to indicate where the shrapnel lies. Then as surgery progresses this painful process must be repeated in order to see if any shrapnel remains.

With a large version of my invention the hammock could be replaced by the litter. The soldier could be lifted directly into the rigid frame, X-rayed from all sides, operated on, X-rayed and removed without ever doing more than lifting and lowering the litter. This would decrease suffering and speed up surgery and X-ray methods.

The invention is substantially as herein described, the exact shape, size, or material could be changed without

deviating from the spirit of my invention, or the scope of the accompanying claims.

Having thus described my invention, I claim:

1. In an anatomical suspension frame, a rigid rectangular support having upright legs, said legs having their upper ends interconnected, the lower ends of said upright legs having means to hold them rigidly in place, all said connections having limited adjustable means, all said upright legs having positioning supports facing to the outside of the frame, a flexible container within said rigid support, a pair of adjustable means to position said flexible container within said rigid support.

2. In a portable anatomical suspension frame, a rigid support, a flexible container within said rigid support, a pair of lifting and positioning handles having means to attach them to said rigid frame and means to attach them to said flexible container within said rigid support.

3. In an anatomical support frame, a rectangular rigid support having four upright legs, said legs having their upper ends connected to form a rectangle, the lower ends of said upright legs being rigidly held in position, a flexible container within said rigid support, a pair of lifting and positioning handles having means to attach them to said rigid frame and means to attach them to said flexible container within said rigid support.

4. In an anatomical suspension frame, a rigid supporting frame having upright legs, said legs having their upper ends interconnected, the lower ends of said legs being held in place by a pair of parallel connectors, all said connectors being adjustable as to length, a flexible container of rectangular shape, having holding means attached to each corner, said container being positioned within said rigid support, a pair of lifting and positioning handles having means to attach them to said rigid support frame and means to attach them to said flexible container within said rigid support.

5. In an anatomical support frame, having upright legs, said legs having their upper ends connected by adjustable means to hold them rigidly in place, the lower ends of said legs being rigidly held in place by adjustable means, said adjustable means allowing lengthening and/or widening of the support frame, means attached to the upright legs for supporting a flexible container within said support frame at various heights and means for holding an X-ray plate holder in a vertical, horizontal or angular position within or at the side of said anatomical support frame.

References Cited in the file of this patent

UNITED STATES PATENTS

819,916	Newcomb	May 8, 1906
1,487,150	Deakins	Mar. 18, 1924
1,934,302	Greenwood	Nov. 7, 1933

FOREIGN PATENTS

9,620	Great Britain	1915
-------	---------------	------

OTHER REFERENCES

Tiemann's Catalogue, 1899, Fig. 4084, page 653.