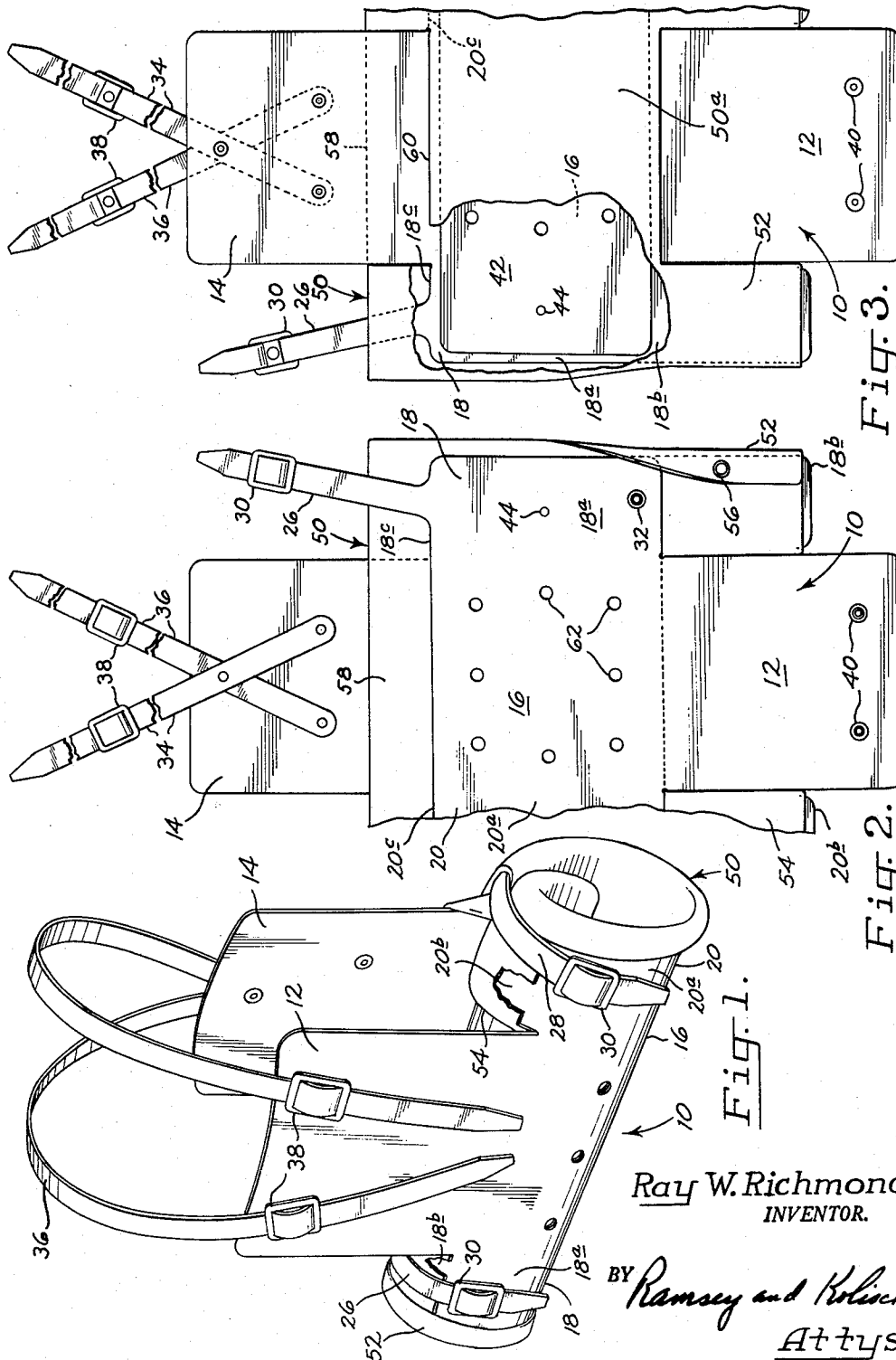


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ORTHOPEDIC APPLIANCE

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ORTHOPEDIC APPLIANCE

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This invention relates to orthopedic devices, and concerns more particularly an abduction device or appliance to be applied to the legs of a patient, for holding the legs in a laterally spread-apart position.

A congenital defect sometimes found in infants is a malformation of the hip socket where the upper leg bone and pelvis are joined together. The hip socket is not sufficiently deep to permit full articulation of the upper leg or thigh bone, with the leg properly seated therein. A form of orthopedic therapy applied to correct such a condition is to spread the legs of the infant apart, and hold them substantially immovable in this spread-apart position for an extended period, of, for example, about six months. During this time, cartilage material at the joint tends to grow about the joint with the formation of a stronger and deeper socket. Natural growth of the infant is accompanied with development of the cartilage and improvement in muscle tone, with the result that the thigh bone ultimately is held in the pelvis in a true ball-and-socket type joint, without the thigh bone having a tendency to slip from place.

Conventional practice has comprised making a rigid plaster cast for the infant, with such cast encompassing the lower torso or trunk of the child and with its legs in an abducted position. The use of such a cast has been accompanied with several disadvantages. These include the fact that the cast is difficult to put on and can be used only once. It is also uncomfortable to the child. Very important, problems of sanitation are raised. The ordinary diaper cannot be used, and after a short period of time, the cast is dirty and unsightly.

A general object of this invention is to provide a novel orthopedic device for the treatment of such congenital defects, which is easily placed in proper position on a child to hold its legs spread apart and immovable, and is easily removed.

A somewhat related object is to provide an orthopedic appliance or device for holding a child's legs abducted, which is readily removed to permit the changing of a diaper and can then be reused. As a result, far more sanitary conditions of treatment may be maintained than previously possible.

More specifically, it is an object of the invention to provide a novel orthopedic device, which comprises a sheet of stiff and flexible material, having an intermediate portion that supports the base of the buttocks and the area between the legs of an infant with the legs abducted, and ends that extend up the front and back side of the infant, and that further includes on each side of said sheet leg-holding means for holding an infant's legs immovable and in spread-apart position.

Another object is to provide an orthopedic device that comprises a sheet of material that is stiff and flexible, with ends in operative position extending up the back and front side of a patient, where such ends are connected by means extending over the shoulders of a patient to hold the device in place.

Yet another object is to provide an orthopedic device having means for holding a patient's legs spread apart where said means takes the form of elongated portions of material that in operative position are wrapped around the legs to hold them immovable, and to provide such a device where the elongated portions of material are held in operative position by detachable means.

A still further object is to provide an orthopedic device

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with a flexible sheet providing the support in the device and that further includes a novel cushioning element easily removed from the flexible sheet that provides the support.

The foregoing, as well as other objects and advantages, are attained by the invention, and the same is described hereinafter in conjunction with the accompanying drawings, wherein:

FIG. 1 illustrates the orthopedic device or appliance in operative position, as it would look when placed on a child with the child's legs fitted therein and immovably supported in spread-apart position;

FIG. 2 illustrates the device in FIG. 1, with portions removed, and with the device opened up and flattened out, and illustrating the side that forms the outer side thereof in FIG. 1; and

FIG. 3 is a view, with portions removed, of the device flattened out as in FIG. 2, but showing the side that forms the inside of the device, with the device in operative position, as in FIG. 1.

Referring now to the drawings, and first of all with principal reference to FIGS. 2 and 3, the device of the invention comprises a sheet of flexible material 10, having what, in operative position, are front and rear flap or end portions, indicated at 12 and 14, respectively. Joined with the lower margins of flap or end portions 12 and 14, and connecting them together, is a connecting or intermediate portion 16, such connecting portion in the embodiment illustrated actually being an integral part of the sheet from which flap portions 12, 14 are formed.

On each side of connecting portion 16, and joined along a side margin thereof with portion 16, is a web or portion of material indicated in the drawings at 18 and 20, respectively. Again, in the embodiment shown, such webs of material are internal parts of the sheet from which the flap portions and connecting portion 16 are formed. Each web or portion of material includes a base portion, indicated for the two portions at 18a, 20a, respectively, that in effect is an extension of connecting portion 16, and a flap end, indicated at 18b, 20b, respectively, that extends parallel to flap 12 and to one side of it, with the device opened up as in FIGS. 2 and 3. The flap ends, therefore, save for their joinder with base positions 18a, 20a are disconnected from the remainder of the sheet.

As will become apparent from the description below, during use of the device flap portions 12 and 14 are strapped in an upright position, and the flap ends described are wrapped about upper portions of a patient's legs to hold them immovable. Thus, detachable means is provided for holding flap portions 12 and 14 upright and beside the trunk or torso of a patient and with connecting portion 16 against the base of its buttocks and between its legs, and additional detachable means is provided for securing the flap ends in place about the legs.

Specifically, integral with webs of material 18, 20, and extending in FIGS. 2 and 3 in a direction opposite the flap ends 18b, 20b, are a pair of strap portions 26, 28. The ends of the strap portions have adjustably mounted thereon snap fasteners 30. These have sockets adapted to be snapped over catches 32 mounted on webs of material 18, 20. The strap portions, snap fasteners and catches constitute the detachable means for holding the flap ends in place in operative position. Strap portions 34, 36 are riveted to flap portion 14, and mounted on strap portions 34, 36 are adjustable snap fasteners 38. These have sockets adapted to be snapped over catches 40 mounted on flap portion 12. Strap portions 34, 36 and the fasteners and catches associated therewith constitute the detachable means for holding flap portions 12, 14 in place.

To make connecting portion 16 and that part of the

device that supports the base of a patient's buttocks and legs somewhat stiffer, a sheet of reinforcing material 42 is attached by rivets 44 over the inner side of the connecting portion (see FIG. 3). Preferably the ends of this reinforcing sheet extend over base portions 18a, 20a of webs of material 18, 20, as shown.

Completing the description of the construction of the device, a cushioning element is indicated at 50. This comprises a sheet of fabric, with a body portion 50a that substantially covers connecting portion 16, and arm portions 52, 54 that may be folded over to form sleeves covering flap ends 18b, 20b, respectively. Each portion is opened up to enable removal of the cushioning element, by opening a snap fastener 56 (see FIG. 2). With the arm portions folded over in the form of sleeves covering flap ends 18b, 20b, the cushioning element is held from shifting upwardly in FIG. 2 relative to the sheet of flexible material 10 that mounts the cushioning element. Cushioning element 50 also is provided with a band of material 58 that extends over the outside of sheet 10. The band is formed by slotting element 50 with a slot 60, such slot being about as long as flap portion 14 is wide. Shoulder portions 18c, 20c of the webs of material 18, 20, by sticking out to either side of the ends of slot 60, inhibit shifting of cushioning element 50 with respect to sheet 10 downwardly in FIG. 2.

Apertures are provided in sheet 10 and reinforcing sheet 42 whereby air can circulate through the cushioning element and more comfort is provided the patient. These apertures are indicated at 62.

Reference is now made to FIG. 1, which shows the device in operative position, or as it would look holding the legs of an infant abducted. In such operative position, flap portion 12 forms the front and flap portion 14 the back of the device. Straps 34, 36 are in position to extend up over the shoulders of a child, and have their ends fastened to the front flap portion. The straps are operable to hold connecting portion 16, and the reinforcing seat covering the inside of portion 16, snugly against the base of the buttocks of a child, and because of the width of the connecting portion, a child's legs are supported spread laterally apart. Flap ends 18b, 20b are wrapped around to form the sleeves for enveloping the upper extremities of a child's legs, and are held in wrapped around position by strap portions 26, 28. In this wrapped-around position, web portions 18, 20 function as leg-holding means or portions operable to hold a child's legs immovable. Thus, connecting portion 16 can be said to constitute a mounting of stiff material connecting the two leg-holding means and supporting them in a position where legs held thereby are held spread apart.

The orthopedic device has been found to give an unyielding type of support entirely adequate in promoting the corrective growth required in a child. The device is relatively light and considerably more comfortable for a child than the usual rigid plaster casts. Most important, the device may easily be removed, washed and then reused, and so also may the cushioning element in the device be easily detached and replaced. As a result, more sanitary treatment is possible.

The device is constructed to hold both legs abducted because it has been found that where only the malformed leg is placed in a spread-out position hyperextension of the leg tends to occur.

I claim:

1. An orthopedic abduction device comprising a sheet-like body of stiff and flexible material having ends adapted to be placed over the back and front of a patient, and an intermediate portion between said ends adapted to be placed between and support the legs of a patient; said sheet-like body also having on each side of said intermediate portion a web of material including a base portion

joined to said intermediate portion and bounded by a shoulder that projects laterally outwardly to one side of the ends of said sheet-like body; each of said webs of material terminating in a flap end that projects away from the shoulder of the web; said flap ends being adapted to be wrapped around a patient's leg; and a cushioning element detachably mounted on said sheet-like body having a slot adjacent one margin thereof; said cushioning element being mounted on said sheet-like body with one of said sheet ends projecting through said slot; said cushioning element including adjacent said slot an expanse of material that covers the inside of said intermediate portion of said body; said cushioning element having a pair of spaced-apart sleeve portions joined to said expanse of material and opposite the margin having said slot; said sleeve portions fitting about the flap ends on each side of said intermediate portion, one about each flap end.

2. An orthopedic device comprising a sheet-like body of stiff and flexible material having ends adapted to be placed over the back and front of a patient and an intermediate portion between said ends adapted to be placed between a patient's legs; said sheet-like body also having on each side of said intermediate portion a web of material bounded by a shoulder that projects laterally outwardly to one side of the ends of said sheet-like body; and a cushioning element detachably mounted on said sheet-like body; said cushioning element including an expanse of material covering the inside of said intermediate portion, and a band portion extending over the outside of one of said ends of said sheet-like body having end portions joined to said expanse of material adjacent said shoulders; said band portion by reason of the joinder of end portions thereof with said expanse of material defining a slot through which said one of said ends of said sheet-like body projects.

3. An orthopedic abduction device comprising a one-piece sheet of stiff and flexible material having front and rear flap portions adapted to be placed over the front and back of a patient and an intermediate portion between said front and rear flap portions adapted to be placed between and support the legs of a patient with the legs spread laterally apart; said sheet also having, on each side of said intermediate portion, a web of material including a base portion joined to said intermediate portion and a flap end joined to the base portion that is otherwise disconnected from the remainder of said sheet; each of said flap ends having a length sufficient to enable it to be wrapped around the upper extremity of a patient's leg and substantially meet the base portion of said web; means for holding each of said flap ends in operative position about the legs of a patient; a reinforcing sheet separate from the first-mentioned sheet extending over the inside of said intermediate portion and having opposite margins adjacent said front and rear flap portions of said first-mentioned sheet; means securing said reinforcing sheet to said first-mentioned sheet including fasteners joining only portions of said reinforcing sheet between said opposite margins to said first-mentioned sheet whereby said opposite margins of the reinforcing sheet are left free; and means for holding the front and rear flap portions of said first-mentioned sheet on the torso of a patient.

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