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DEVICE FOR PREVENTING THE ORTHOPEDIC DISTORTION
OF INFANT'S LEGS
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3,505,994

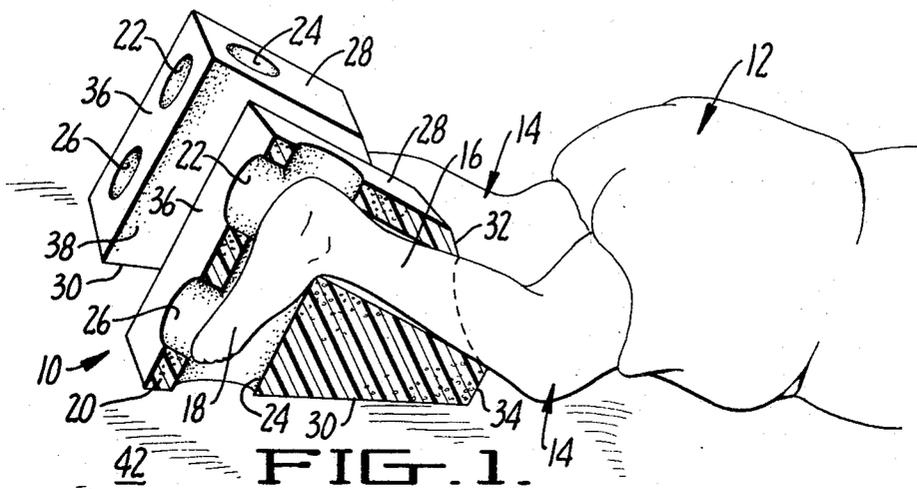


FIG. 1.

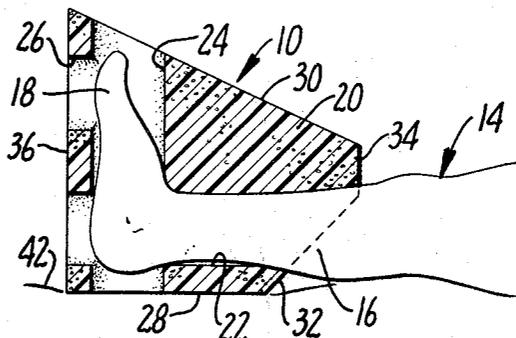


FIG. 2.

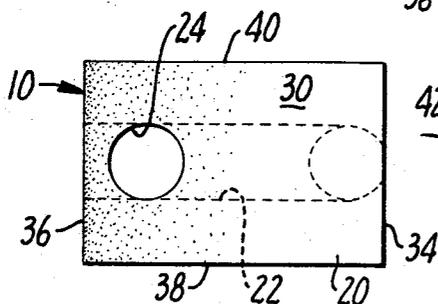


FIG. 4.

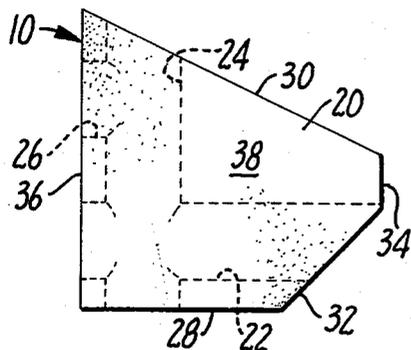


FIG. 3.

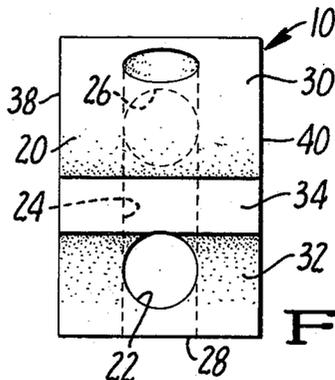


FIG. 5.

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DEVICE FOR PREVENTING THE ORTHOPEDIC DISTORTION OF INFANT'S LEGS

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5 Claims

ABSTRACT OF THE DISCLOSURE

A boot-like device for maintaining the leg of an infant in substantially straight condition during periods of supine or prone relaxation. The device comprises a block of soft elastomeric material having a pair of intersecting bores therein adapted, respectively, to snugly receive and retain the calf and foot of an infant. The sides of the block are designed to effect its support in alternative predetermined positions when an infant wearing the block is in relaxed prone or supine position on a substantially flat surface. Normally, a block is applied to each calf and foot of an infant to effect the simultaneous treatment of both of the infant's legs.

The present invention relates generally to the field of orthopedic corrective devices and, more particularly, is directed to such a device designed to prevent distortion of an infant's legs during initial periods of rapid growth.

In the prior art, various types of orthopedic corrective devices have been provided for the treatment of problems associated with the legs. The most common of these takes the form of braces designed to correct problems after their occurrence by forcing the portion of the leg being treated to a predetermined position and maintaining it in this position. Certain of these are also designed to prevent orthopedic distortion during initial periods of an infant's growth. In the latter category, some function to tie the feet of an infant together and, thus, restrain leg and foot movement. Certain others in the latter category permit freedom of leg movement, but only provide for treatment of the foot and angle. Patent Nos. 2,787,263 and 3,121,425 are representative of the art relating to devices designed to prevent orthopedic distortion during initial periods of an infant's growth.

Prior art devices designed to prevent orthopedic distortion during initial periods of rapid growth have not provided for controlled positioning of an infant's entire leg while, at the same time, permitting freedom of leg movement. This has resulted because the devices have either acted as positive restraint, or as limited ankle and foot distortion preventers. Consequently, such devices have not been generally accepted by either the medical profession or the parents of infants in need of orthopedic correction.

The device of the present invention comprises, basically, a block of soft elastomeric material having intersecting bores therein to snugly receive and retain an infant's foot and calf and external support surfaces positioned to support the block in alternative predetermined orientations when an infant wearing it is relaxed, respectively, in supine or prone position. The block is preferably formed of a unitary mass of expanded polyvinyl material, such as foam polyethylene or polyurethane, and employs the resiliency and proportioning of the bores to retain an infant's calf and foot therein. No attaching straps, tapes or other appurtenances on the block are required for retention purposes. The latter characteristic avoids the possibility that any attaching appurtenances may be misplaced or employed to over-tighten the block. It also results in a simplified structure ideally suited for

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fabrication from expanded polyvinyl material with a minimum of expense.

It is, accordingly, a principal object of the present invention to provide an orthopedic distortion preventing device which avoids the shortcomings of the prior art.

Another and related object of the invention is to provide such a device which automatically settles into corrective condition whenever an infant wearing the device assumes a relaxed supine or prone position.

Still another object of this invention is to provide such a device which functions as a soft cushion for the foot and ankle of an infant wearing it.

These and other objects and the specifics of the invention will become more apparent when viewed in light of the following detailed description and accompanying drawings wherein:

FIG. 1 is a perspective view, partially in section, illustrating a pair of the inventive devices in the positions they assume when worn by an infant in relaxed prone position;

FIG. 2 is an elevational sectional view illustrating one of the devices in the position it assumes when worn by an infant in relaxed supine position; and

FIGS 3, 4, and 5 are elevation plan and end views, respectively, of the device.

Referring now more specifically to the drawings, the numeral 10 therein is employed to designate the inventive device in its entirety. As seen in FIG. 1, two such devices, identical in construction, are illustrated. This figure depicts the manner in which the devices are normally employed in pairs to effect the simultaneous treatment of both legs of an infant. An infant is designated by the numeral 12 in FIG. 1 and is shown as having legs 14 in the process of being treated. The calf and foot of each of the legs 14 are designated by the numerals 16 and 18, respectively.

The devices 10 each comprise a block, designated by the numeral 20, fabricated of a soft elastomeric material. Preferably, this material is of the expanded resinous type, such as foam polyurethane or foam polyethylene. The blocks 20, as will be apparent to those skilled in the art, may be formed into final configuration by direct molding, by cutting, or by a combination of these steps.

Each block 20 has first and second intersecting bores 22 and 24, respectively, extending therethrough in right angled relationship relative to each other. These bores are of substantially rectilinear configuration and extend completely through the block. Thus, the ends of each of the bores open through opposite sides of the block. An opening 26 also extends through the block into communication with the bore 24 intermediate its intersection with the bore 22 and the upper side of the block, as viewed in FIG. 2. The opening 26, together with the open ends of the bores 22 and 24, facilitate manual placement of an infant's foot and calf within the intersecting bores 22 and 24, respectively.

The blocks 20 also have formed thereon first and second support surfaces or sides 28 and 30, respectively. These surfaces, as will become more apparent subsequently, are adapted to support the blocks in either of the two alternative positions illustrated in FIGS. 1 and 2. The surface 28 is disposed in a plane parallel to the bore 22 and normal to the plane defined by the axes of the intersecting bores 22 and 24. The surface 30 is disposed in a plane in acute angular relationship to the surface 28 and normal to the plane defined by the axes of the intersecting bores. In the preferred embodiment illustrated, the acute angle defined between the surfaces 28 and 30 is approximately 25°.

The side of the block 20, designated by the numeral 32, through which the calf receiving open end of the bore 22 opens is disposed at an oblique angle with respect to the

bore. Thus, the opening of the bore through this side has a circumference of greater lineal dimension than the interior of the bore. This characteristic facilitates the threading of the foot and calf of an infant through the opening and into the bore 22.

The remaining sides of the block 20 are designated by the numerals 34, 36, 38 and 40. The side 34 extends between the sides 30 and 32. The side 36 extends between the sides 28 and 30 over the full length of the bore 24. This side, in effect, shields the foot of an infant received in the bore 24 from abutment with a surface upon which either of the sides 28 and 30 is supported. The sides 38 and 40 are parallel to each other and the plane defined by the axes of the bores 22 and 24. Although not illustrated, these sides function to maintain a pair of blocks worn by an infant in parallel stacked relationship when the infant is lying on its side in relaxed position.

In application, one of the devices 10 is applied to each foot of an infant as illustrated in FIGS. 1 and 2. This application is effected by threading the infant's foot and calf through the bore 22 and manipulating the foot into the bore 24. The manipulation of the foot may be manually effected and visually observed through the ports provided by the ends of the bores in the opening 26. The bores 22 and 24 are proportioned, respectively, to snugly receive the calf and foot of an infant therein without restricting circulation. The snugness with which the bores effect engagement is, preferably, just sufficient to maintain the calf and foot received therein in the plane defined by the axes of the bores. The latter relationship is also provided by proportioning the bores so that they extend, respectively, over a substantial length of a calf and foot received therein. In the preferred embodiment, the bore 24 extends beyond the full length of a foot received therein and functions both to shield the foot and effect its lateral restraint.

Once applied, the devices 20 function as illustrated in FIGS. 1 and 2, respectively, to maintain the legs of an infant in relatively straight condition when the infant is relaxed in prone and supine positions on a flat surface. For the sake of illustration, a flat surface, such as a mattress is designated by the numeral 42 in FIGS. 1 and 2. In the prone position of the infant illustrated in FIG. 1, the sides 30 rest on the surface 22 and support the blocks in an upright condition maintaining the feet and calves of the infant in vertical planes. In the supine positions shown in FIG. 2, the sides 28 rest on the surface 42 and also support the blocks in an upright condition maintaining the feet and calves of the infant in vertical planes. Thus, whether sleeping in a prone or supine position, the legs of an infant wearing the devices 10 are maintained in relatively straight condition and prevented from assuming the usual distorted "prenatal" position.

From the foregoing description, it is believed clear that the present invention enables the attainment of the objects initially set forth herein. In particular, a device is provided which facilitates both freedom of leg movement and automatic settling of the legs into substantially straight condition during sleep. The latter characteristic is especially desirable during initial periods of rapid growth when infants typically sleep the majority of each day.

It is to be understood that the invention is not intended to be limited to the specifics of the foregoing description, but rather is defined by the following claims.

What is claimed is:

1. A device for preventing the orthopedic distortion of the foot and leg of an infant during initial periods of rapid growth, said device comprising a block fabricated of soft elastomeric material and having:

(A) First and second intersecting bores defining, together, a plane and adapted, respectively, to snugly receive and retain the calf and foot of an infant therein;

(B) a first side adapted to support said block in a first predetermined orientation on a substantially flat surface when said infant is relaxed in supine position on said surface, said first side being disposed in a plane substantially parallel to said first bore and normal to the plane defined by said bores; and,

(C) a second side adapted to support said block in a second predetermined position on a substantially flat surface when said infant is relaxed in prone position on said surface, said second side being disposed generally opposite said first side in a plane in acute angular relationship with respect to said first side and substantially normal to the plane defined by said bores.

2. A device according to claim 1 wherein said first and second bores are disposed in normal relationship relative to each other.

3. A device according to claim 1 wherein:

(A) Said first bore opens through one side of said block to permit the passage of the foot and calf of an infant therethrough; and,

(B) The side of said block through which said first bore opens is disposed at an oblique angle with respect to said bore.

4. A device according to claim 1 wherein:

(A) Said first and second bores extend substantially rectilinearly; and,

(B) Both ends of each of said bores open through the sides of said block.

5. A device according to claim 4, wherein:

(A) Said block is adapted to shield the foot of an infant received in said second bore from abutment with a surface upon which either of said first or second sides rests; and,

(B) Said block has at least one opening extending therethrough into communication with said second bore intermediate the ends of said second bore and laterally of the intersection thereof with said first bore.

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