Jan. 12, 1960 R. W. ROGERS 2,920,620

ORTHOPEDIC DEVICE

Filed Oct. 15, 1958

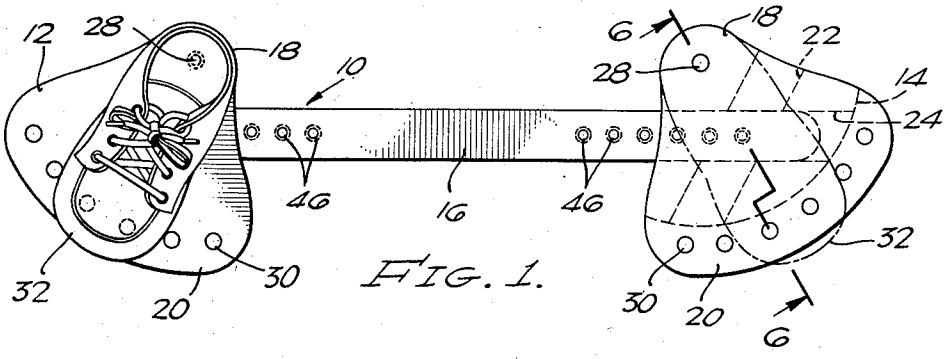


FIG. 1.

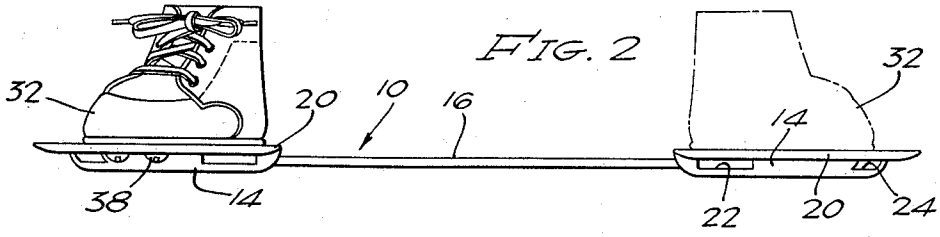


FIG. 2

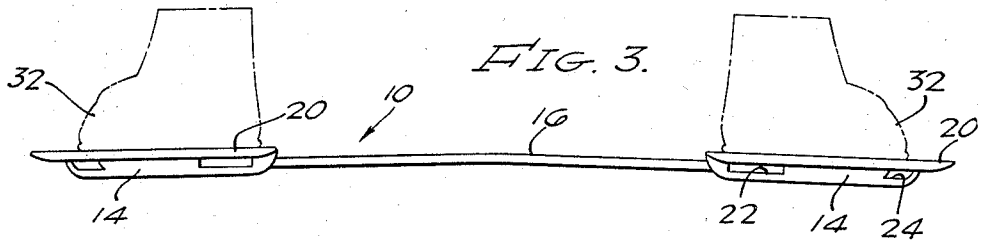


FIG. 3.

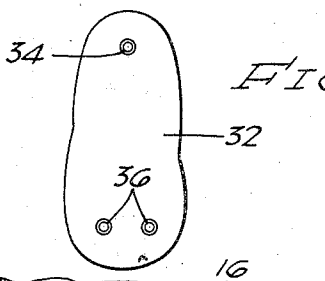


FIG. 5.

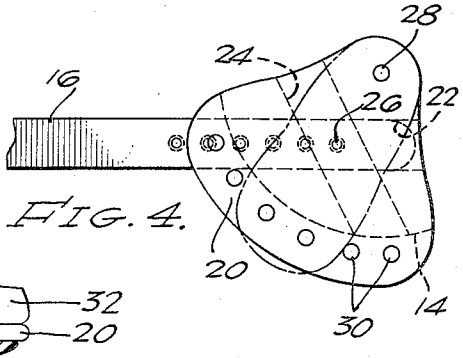


FIG. 4.

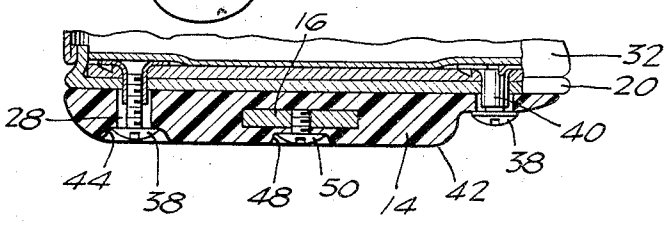


FIG. 6.

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ORTHOPEDIC DEVICE

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6 Claims. (Cl. 128—80)

The present invention relates to improvements in orthopedic devices and particularly to such devices used in the treatment of congenital and acquired deformities in children's legs or feet, such as for example, club feet, foot abduction, foot adduction, knock knees, and bow legs.

In treating abnormal foot and leg conditions, responsive correction may be achieved by rotating the deformed limb or limbs about one or more axes and maintaining the limb in a predetermined position. The degree and combination of attitudes required to effect proper orthopedic treatment varies considerably with the individual. Preferably, therefore, orthopedic devices should have a wide range of adjustment and adaptability.

Conventional devices now in use are specially made to meet the requirements of individual patients requiring close cooperation between the orthopedic surgeon and a splint marker. Such conventional devices, in addition, have only a limited range of adjustment and adaptability requiring progressive changes in the splint or orthopedic device as the improvement in the affected limb results in a need for less and less displacement of the limb. Further, such devices are awkward and cumbersome, restricting the activity of the child, and when in use tend to damage sheets, blankets, furniture, etc., with which the device comes in contact. Finally, such devices are formed with the child's shoe as an integral part thereof, complicating the problem of replacement as the size of the child's foot increases with age.

Accordingly, it is an object of this invention to provide an orthopedic device or splint suitable for correcting a wide variety of abnormal foot and leg conditions which will overcome the above disadvantages.

It is a further object of this invention to provide an orthopedic splint which is sufficiently adjustable and adaptable to permit the device to be substantially universal and rapidly applied to a wide variety of patients.

Still another object of this invention is to provide a construction by which shoes may be mounted upon the orthopedic splint in a positive but simple manner, permitting easy removal at a later time.

Still another object of this invention is to provide such an orthopedic device which is of simple and practical construction having a plurality of interchangeable parts thereby considerably reducing manufacturing costs and retail distribution problems.

A more particular object of this invention is to provide such a device having no rough or sharp edges or projections, reducing the probability of damage to sheets, bedding and furniture to a minimum.

Other objects and advantages of this invention will be apparent, it is believed, to those skilled in the art from the following detailed description of a preferred embodiment thereof when taken in connection with the accompanying drawings in which

Fig. 1 is a top plan view partially in section of the orthopedic device.

Fig. 2 is a side elevation of the device partially in phantom.

Fig. 3 is a side elevation of the device partially in phantom illustrating the spacing bar in a bowed condition suitable for the correction of knock knees.

Fig. 4 is a partial plan view of the plate member slidably mounted upon the spacing bar at the extreme inward transverse shoe offset.

Fig. 5 is a bottom plan view of a shoe adapted to be attached to a plate member.

Fig. 6 is a partial sectional view taken substantially along the line 6—6 of Fig. 1.

Referring now to the drawings, the orthopedic device indicated generally at **10** includes a pair of plate members or shoe holding platforms **12** and **14** and a spacing bar **16**. The plate members **12** and **14** are identical in form and as shown in the drawings are preferably sectorially shaped, each having a rounded apex end **18** and an arcuate opposite end **20**. Each plate member is provided with a pair of guide channels **22** and **24** transversing the plate member or platform obliquely between the apex end **18** and the arcuate opposite end **20**. The channels **22** and **24** intersect one another at approximately midpoint **26** of the platform. This construction permits the platform to be positioned on the bar **16** in two attitudes displaced at approximately 60° to one another. This is illustrated by the relative positions of the plate member **14** in Figures 1 and 4.

Each platform is provided with means for attaching a child's shoe in various angular positions. Preferably these means include an opening **28** at the apex end **18** and a plurality of openings **30** uniformly displaced along the arcuate end **20**.

A child's shoe **32** adapted to be attached to either of the platforms **12** or **14** is shown in bottom plan in Figure 5. This shoe is provided with a threaded heel opening **34** adapted to match with the opening **28** and a pair of threaded toe openings **36** adapted to match with adjacent openings **30** of the arcuate end **20**.

By this construction it will be apparent that the shoe **32** can be positioned on either platform **12** or **14** in a plurality of angularly disposed positions by securing the shoe to the platform with suitable bolts **38** adapted to be received within the respective threaded openings.

As shown in Figure 6 the bottom of the shoe **32** is provided with suitable threaded sleeves **40** to receive the bolts **38** while the bottom **42** of the platform is provided with suitable recesses **44** at one extremity of the opening **28** to receive the head of the bolts **38**.

The spacing bar **16** is adjustably received within one of the channels **22** or **24** of each platform **12** and **14**. The bar **16** is provided with a plurality of threaded openings **46** at either end thereof by means of which the platforms may be adjustably positioned along the length of the bar.

The lower side of each platform is provided with a recessed opening **48** at approximately the mid-point **26** thereof. The opening **48** is adapted to receive a bolt **50** which threadedly engages one of the openings **46** of the bar **16**. By this construction the linear distance between the platforms **12** and **14** can be carefully and accurately controlled.

The platforms **12** and **14** may be formed of any suitable material. I prefer, however, to form them of synthetic resins or plastic materials for ease of manufacture and to permit use of materials which, while being strong, will not tend to damage furniture, rugs, or other material with which the device comes in contact.

The spacing bar **16** is preferably formed of metal so that it may rigidly hold the platforms in a predetermined spaced relationship.

In many cases it is desirable to have both platforms and thus both shoes lying within a single plane. However, in correcting leg as distinguished from foot deformities it is sometimes desirable, as shown in Figure 3, to distort the bar **16** in order to force the legs in or out. The bar is thus bendable to tilt the plate members relative to one another.

In the use of the device thus described, an orthopedic surgeon, having examined a patient and decided on a course of treatment, determines the relative amount of longitudinal rotation of the foot about the normal axis desirable for the corrective measure. The platforms **12** and **14** are then positioned upon the bar **16** by inserting the ends of the bar in one or the other of the channels **22** or **24**. The opening **48** is positioned adjacent one of the openings **46** determined by the desirable spaced relationship of the platforms. The platform is then secured to the bar by the bolt **50**. By suitably positioning the platforms on the bar the physician may secure shoes thereto by the manner previously described in toe-in toe-in relationship, toe-out toe-out relationship, toe-out toe-in relationship, or any degree therebetween.

Finally, in correcting bow legs or knock knees the physician may bend the bar **16** to any desired degree dictated by the prescribed treatment. The child, in wearing this device, has his feet securely held by the shoes **32** so that they are in a substantially permanent angularly displaced relationship, hastening the correction of the deformity.

Since all surface parts of the platforms are smooth and the holding bolts recessed, there is little likelihood that damage to household furnishings with which the child comes in contact will occur.

Further, since the bottom of the platforms are flat, the child is permitted to stand and may even walk.

It will be apparent from the above description of a preferred embodiment of this invention that the particular size of the platforms and length of the bar will be dictated by the size and strength of the patient to be treated. In addition, as the child grows in size, larger shoes may be readily adapted to the same orthopedic device, eliminating the expense of subsequent splint making. Further, as treatment decreases the extent of the deformity, the relative angular displacement of the platforms, shoes or bar may be changed readily and conveniently at home to adjust the splint to the child's changing orthopedic needs.

Finally, it will be apparent that a wide variety of materials and fabrication techniques may be used to construct the present device thereby permitting, in particular cases, the device to be adapted to the individual needs of particular patients.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details set forth, by my invention is of the full scope of the appended claims.

I claim:

1. An orthopedic device adapted for attachment to the shoes of a child, comprising: a pair of plate members each defining a pair of obtusely intersecting guide channels; a bar having ends insertable in a selected guide channel of each plate to dispose said plates in predetermined angular relation with each other; and means for attaching a child's shoe in various angular positions on each plate.

2. An orthopedic device adapted for attachment to the shoes of a child, comprising: a pair of substantially sectorially shaped plate members each having a rounded apex end and an arcuate opposite end, each plate member defining at least one channel traversing said plate member obliquely between said apex end and arcuate end; a bar member having ends adjustably receivable in the channels of said pair of plate members to dispose said plate members in predetermined angular relation; and means for attaching a child's shoe in various angular positions on each plate.

3. An orthopedic device as set forth in claim 2 wherein said plate members are normally coplanar and said bar member is relatively flat in the plane of said plate members and bendable to tilt said plate members relative to each other.

4. An orthopedic device adapted for attachment to the shoes of a child, comprising: a pair of substantially sectorially shaped plate members each having a rounded apex end and an arcuate opposite end, each plate member defining at least one channel traversing said plate member obliquely between said apex end and arcuate end; a bar member having ends adjustably receivable in the channels of said pair of plate members to dispose said plate members in predetermined angular relation; and means for pivotally attaching the heels of a pair of child's shoes adjacent the apex ends of said plate members, and a plurality of means disposed adjacent the arcuate ends of said plate members to secure said shoes in various angular relations to said plate members.

5. An orthopedic device adapted for attachment to the shoes of a child, comprising: a pair of relatively thin flat plate members each substantially in the shape of a sector and having a rounded apex and an arcuate margin opposite from said apex, the margins of each plate member being upwardly beveled at its under side whereby said plate members may glide over a surface, each plate member defining at least one channel extending parallel to its upper and lower surfaces and traversing said plate member between said apex end and arcuate margin; a bar member having ends adjustably receivable in the channels of said pair of plate members to dispose said plate members in predetermined angular relation; and means for attaching a child's shoe in various angular positions on each plate.

6. An orthopedic device adapted for attachment to the shoes of a child, comprising: a pair of relatively thin flat plate members each substantially in the shape of a sector and having a rounded apex and an arcuate margin opposite from said apex, the margins of each plate member being upwardly beveled at its under side whereby said plate members may glide over a surface, each plate member defining at least one channel extending parallel to its upper and lower surfaces and traversing said plate member between said apex end and arcuate margin; a bar member having ends adjustably receivable in the channels of said pair of plate members to dispose said plate members in predetermined angular relation; and means for pivotally attaching the heels of a pair of child's shoes adjacent the apex ends of said plate members, and a plurality of means disposed adjacent the arcuate ends of said plate members to secure said shoes in various angular relations to said plate members.

No references cited.