

[54] TRACTION SPLINT  
 [76] Inventors: Adolph Eshuis, R.R. 2; Andrew M. Jansma, both of Rock Valley, Iowa 51247

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Primary Examiner—Richard A. Gaudet  
 Assistant Examiner—J. Yasko

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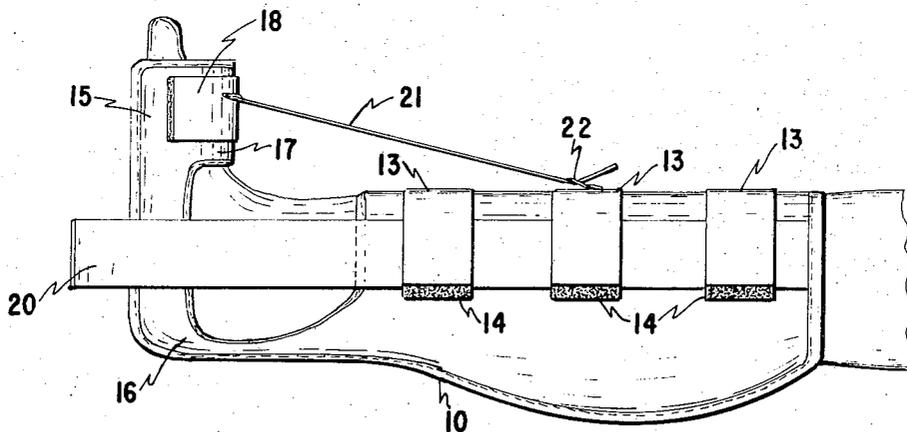
[57] ABSTRACT

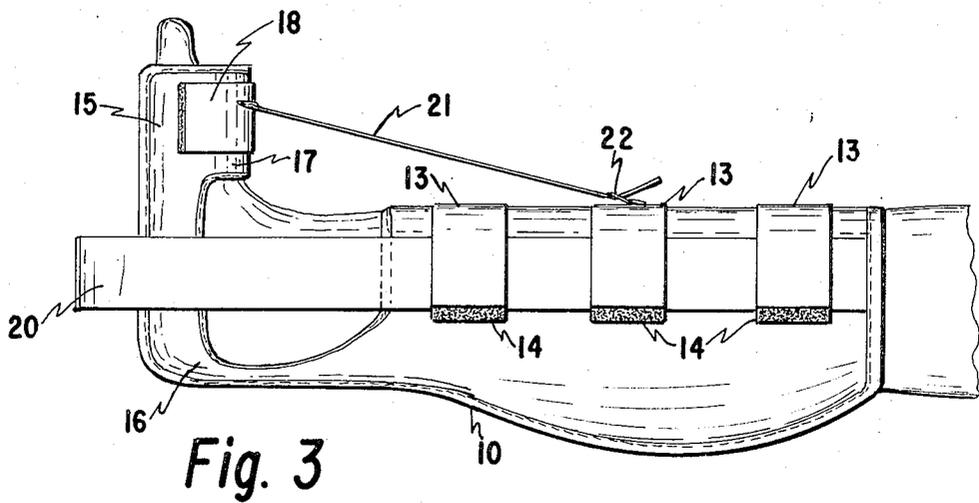
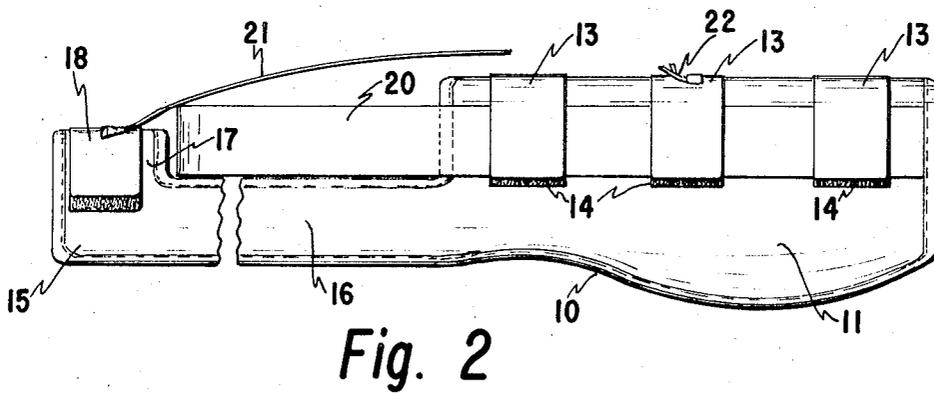
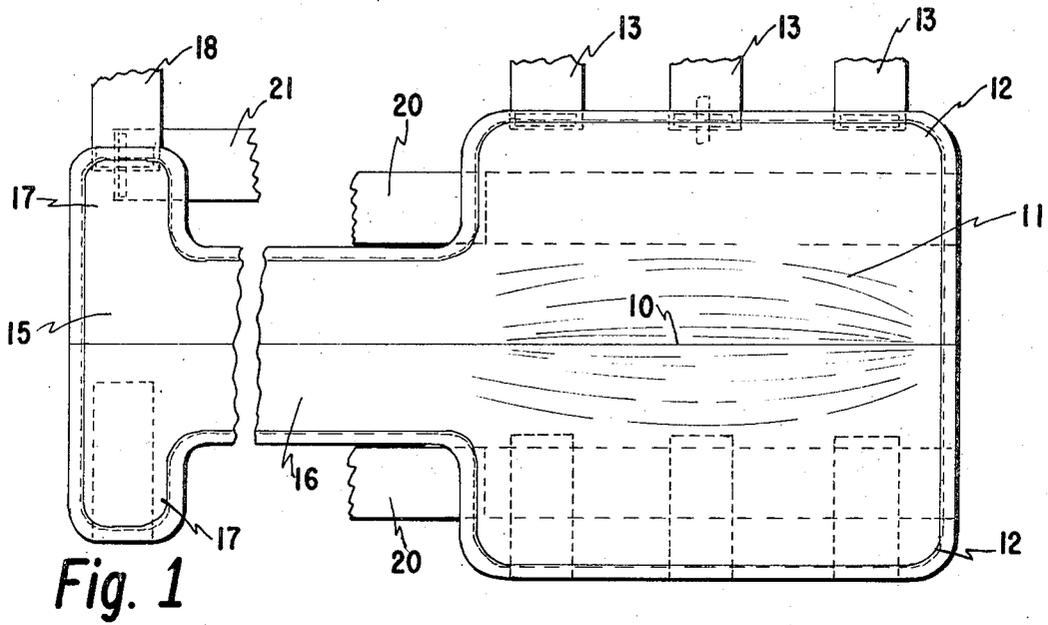
A traction splint including a form fitted body portion adapted to surround the calf of a leg, and to which is fastened a strap to apply a pulling force and a foot portion adapted to support the foot. An elastic strap provides an exercise means by which the problem of "foot drop" may be avoided.

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5 Claims, 3 Drawing Figures





## TRACTION SPLINT

## BACKGROUND AND SUMMARY OF THE INVENTION

This invention pertains to traction splints of the type used on hospital patients where traction applied to the leg is indicated. The device is also adapted to be used in nursing homes or for home use if desired.

There are many times when patients in hospitals or nursing homes are to be treated by applying traction to the leg or legs of the patient. In these cases, some means of grasping the leg is necessary so that the pulling force can be applied.

Present traction devices are made almost exclusively from non-woven materials and are generally of a trapezoidal form when opened. This trapezoidal form is wrapped around the leg of the patient and is snugly fastened above the ankle. A strap may be used to connect weights to the device.

Applying pulling tension to the leg at the ankle in a relatively concentrated area has the effect of cutting off circulation in that region leading to a tissue necrosis. Additionally, there is no support for the foot which leads to a relaxation and weakening of the muscles controlling the foot and causing the problem known as "foot drop."

By our invention we provide a device which applies the force over a broad area of the calf muscle in the patient's leg. As a result, circulation is not normally cut off and there is no necrosis problem. In addition, we provide a means for supporting the foot of the patient. This latter means also allows for exercising the foot muscles so that there is no atrophy and no loss of function.

## FIGURES

FIG. 1 is a plan view of our device opened and lying relatively flat,

FIG. 2 is a side view of the device as it would be closed around a patient's leg but without the foot piece in place, and

FIG. 3 is a view similar to FIG. 2 showing the device as actually applied to a patient's leg and foot with the exercise elastic in place.

## DESCRIPTION

Briefly our device comprises a form fitting leg engaging part adapted to be wrapped about a patient's leg and a foot holding part attached to the form fitting part to allow normal ankle action and an elastic member engaged between the two parts to resiliently resist movement so that the foot controlling muscles will have a force to exercise against.

More specifically and referring to the drawings, our device is made from a heavy woven fabric form lined with a foam material. Two flat pieces are stitched together along a seam line 10 to provide a form adapted to fit the calf of a patient's leg. When stretched out, the device assumes a plan-form somewhat like that shown in FIG. 1. However, the FIGURE does not totally represent the concavity necessary to embrace the muscle. It is apparent that the device cannot lie totally flat in this position.

The body 11 is enlarged in the central part as shown in FIGS. 2 and 3 to fit the calf muscle. Because of that feature, we have found that it may be necessary to pro-

vide two or three sizes, but the use of a wrapped around portion 12 and pressure sensitive fastening tapes 13 allows considerable flexibility so far as size is concerned. The pressure sensitive fasteners on these tapes 13 are of a type well known in the art. The pads 14 to which the tapes 13 fasten are long enough so that there is considerable adjustability provided to accommodate legs of different girth.

A pulling strap 20 is stitched to the wrapped around part 12 and forms a loop to which can be attached the traction weights so that force is transmitted from the weights through the strap 20 to the body 11 of our device. From there it is uniformly distributed as pressure on the calf muscle. Specifically to be avoided is any tightening at the upper end of the form just below the knee. The desired situation is a more uniform distribution of pressure and an avoidance of concentrated tightness which would cut circulation in the leg.

A foot supporting portion 15 is connected to the body 11 by means of a narrower or neck portion 16 all formed integrally in the two flat pieces which are stitched together. The front support portion also has wing portions 17 adapted to be wrapped around the foot and fastened with a pressure sensitive fastener on a tape 18. As illustrated, the foot portion is formed to lie flat when not in use. In use, however, the neck part 16 follows the contour of the patient's heel (FIG. 3) and provides a sort of hinge arrangement so that the patient's ankle is free to operate.

In order to provide a force against which to exercise the foot-controlling muscles, we use an elastic strap 21 which is stitched to one wing 17 of the foot part 15. The other end is adapted to be held preferably by a buckle device 22 fastened to one of the straps 13. A buckle is preferable because then the length and tension in the elastic strap 21 can be varied.

Support of the foot in the normal position is desirable to preserve some normal tension in the muscles where traction is to be continued for some time. In addition, use of the elastic strap 21 provides a pressure against which the foot can be moved to provide a moving exercise which will preserve the muscle tone so that the patient will be able to walk with much more nearly a normal muscle reaction than is often the case with present devices.

In use, the patient's leg is encased by wrapping the portions 12 around the sides of the leg and over the shin. The straps 13 are then pulled up snug (not tight) and are fastened by pressing the pressure sensitive fastener parts together. The foot part is then wrapped around the patient's foot after running the neck part 16 over the heel. Again the fastening is closed. The strap 21 is then pulled up with a small amount of tension and fastened in the buckle 22. Proper traction force can then be applied to the strap 20 to provide the necessary tension. While the device is being used, the patient can exercise his foot against the elastic strap 21 on a more or less regular basis as required.

We claim:

1. Traction means for applying traction force to a patient's leg comprising body means formed to fit the calf of the patient's leg and including fastening means on said body means for securing said body means on the patient's leg, foot supporting means formed integrally with said body means and including fastening means on said foot supporting means for securing said foot supporting means on the patient's foot, elastic means en-

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gaged between said foot supporting means and said body means adapted to hold said foot supporting means in a normal relationship to said body means but allowing movement against the resistance thereof whereby the foot can be exercised and strap means fastened to said body means and extending beyond said foot supporting means whereby tension can be applied to said body means.

2. The device of claim 8 in which a neck portion forming a substantial open space is provided between said body portion and said foot portion.

3. The device of claim 1 in which said elastic means

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is adjustably fastened to said body part.

4. The device of claim 1 in which said body means is held onto the patient's leg by being wrapped around the leg and pressure sensitive means on said body adapted to hold said body part in its wrapped position.

5. The device of claim 1 in which said foot portion is formed to lie flat and is adapted to be wrapped around the patient's foot and pressure sensitive means on said foot portion to hold said foot portion in its wrapped around position.

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