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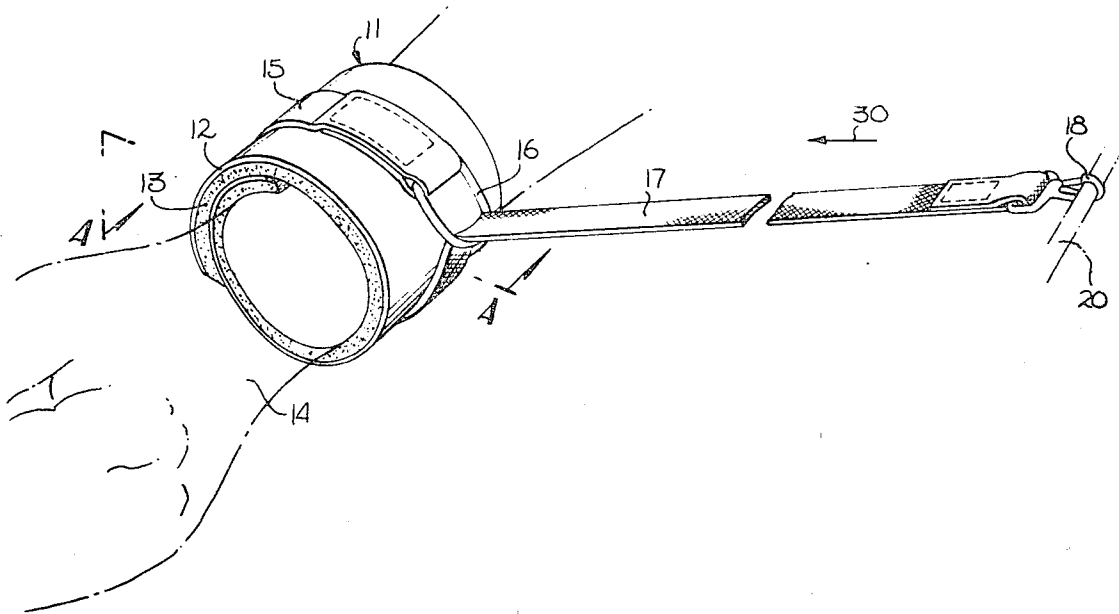
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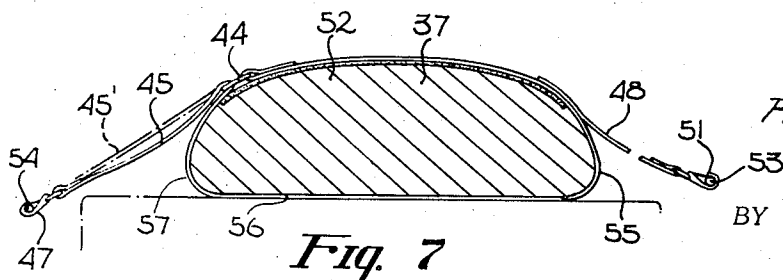
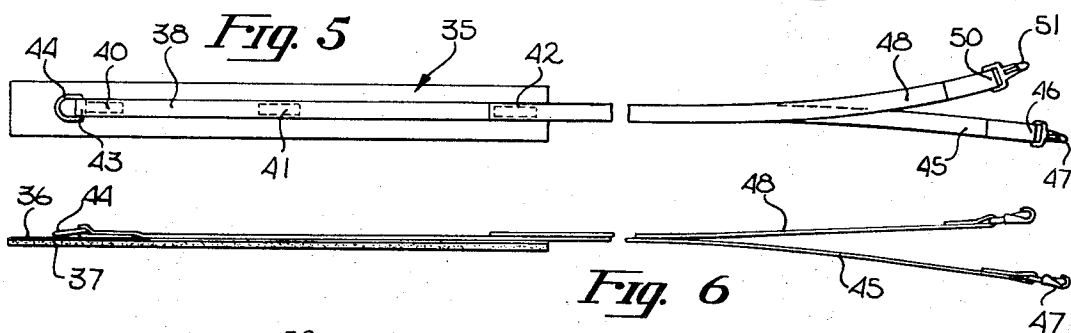
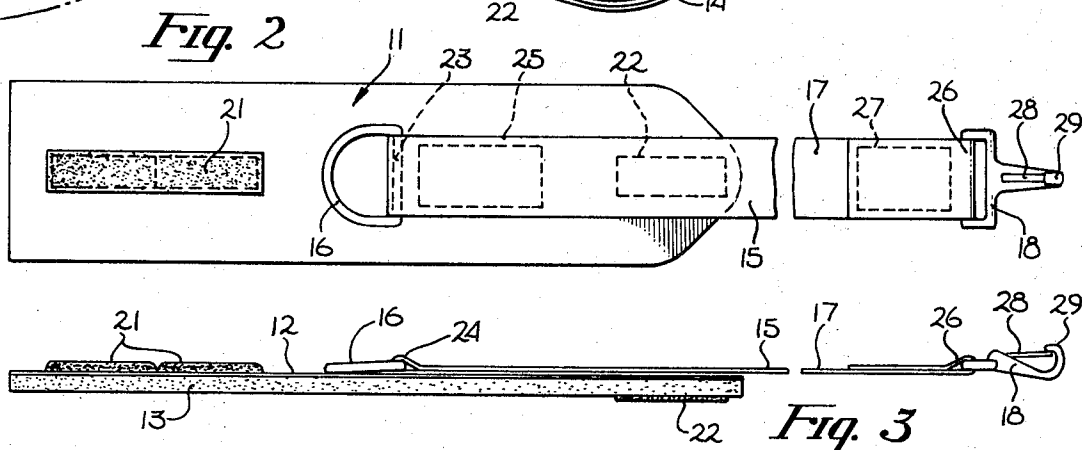
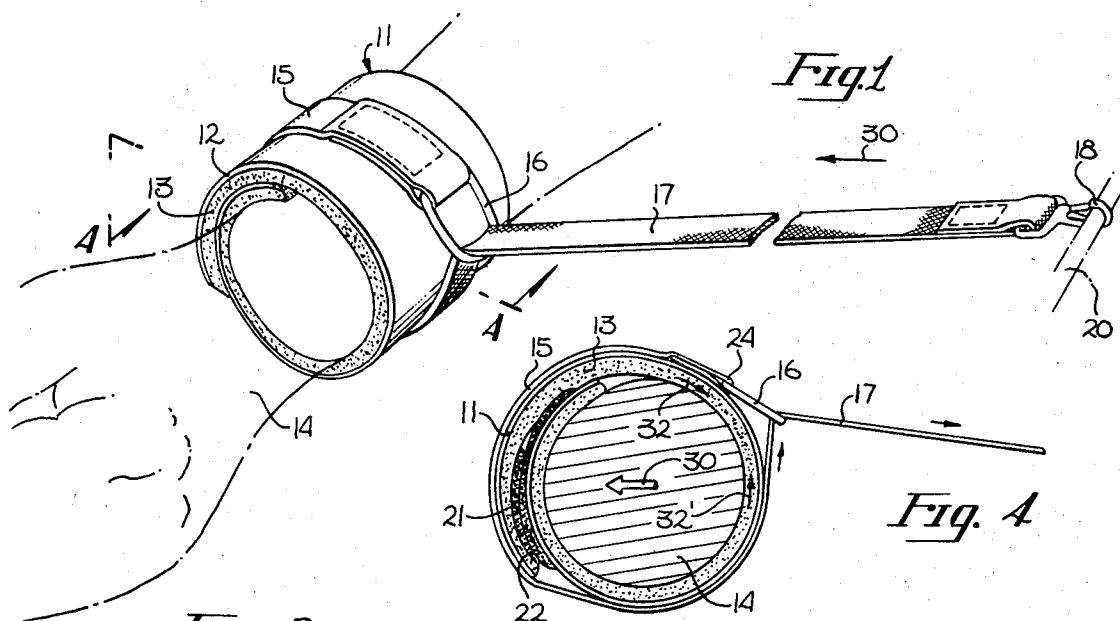
[54] **RESTRAINING DEVICE**
10 Claims, 7 Drawing Figs.

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128/157, 128/169
[51] Int. Cl..... **A61f 13/00**
[50] Field of Search..... **128/134,**
133, 157, 165, 166, 171, 87, 85, 89; 24/72

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ABSTRACT: A restraining device is disclosed herein including an elongated flexible cushion member having a pair of cooperating closure elements secured to the opposite ends of the member so that the member may be retained in a wrapped condition about a body portion. The exposed surface of the cushioned member carries a ring secured to the member mid-way between its opposite ends and at least one strap extending from the member is provided so as to be wrapped about the cushion member, passed through the ring and releasably secured to a supporting structure, such as a bed rail, for restraining the body extremities.





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RESTRAINING DEVICE

BACKGROUND OF THE INVENTION

Under certain circumstances, it is necessary to restrain a patient against movement and to this end in the past, various forms and types of straps, belts and other similar arrangements have been employed to render the body or limbs of the patient substantially immobile. It has been prevalent to hold or restrain an arm, for example, whether for psychiatric applications or medical or surgical reasons, by means of straps or ropes tightly fastened about the body portion by buckles or other fasteners (see U.S. Pat. Nos. 2,998,008 and 3,297,026). It has been found that patients subjected to such devices through psychological motivations attempt to pull on these devices presumably to free the part of the body being restrained. As a result, there is considerable damage inflicted on such an occasion to the part of the body being restrained. Inasmuch as the devices are generally fastened tightly about a body portion, there is no relief from the device even when the patient stops pulling and therefore there is no incentive for the patient to use voluntary restraint.

SUMMARY OF THE INVENTION

The present invention provides a restraining device which is directly secured to the body portion intended to be restrained in such a manner that it is comfortable and not tight when the patient is not applying tensioning or pulling pressure in an effort to obtain freedom for the body part. However, when the patient applies a pulling force in an attempt to become free, the device quickly tightens about the body portion and when this is discovered by the patient, he will quit fighting the restraint.

In one form of the invention, a cushioned member is employed which is wrapped about the limb or other body portion to be restrained and which includes closure elements adapted to secure the opposite ends of the member together when the wrapping of the portion has been completed. A ring is pivotally mounted on the exterior surface of the member which readily receives and slidably engages with an elongated strap that encircles the wrapped cushion member and passes through the ring and further extends to a supporting structure where a releasable fastener carried on the end of the strap connects therewith.

In another form of the invention, a pair of straps are carried on the member wherein one strap may be secured to supporting structure on one side of the bed, while the other strap encircles the desired body anatomy, such as the torso, and passes through the ring for ultimate securement to supporting structure on the opposite side of the bed. Here again, the patient only experiences pressure when he tries to get up.

By means of the novel restraining device, the only circumferential pressure applied to the anatomy is that which accompanies the force developed in the strap of the cushion member. The force and tension developed during efforts of the patient to free the restrained part of the anatomy is applied about the restrained body portion and to the supporting structure, to produce opposite and equal reactions.

Therefore, it is among the primary objects of the present invention to provide a novel restraining device which is adapted to provide extreme comfort to an individual or patient under the most difficult of circumstances.

Another object of the present invention is to provide a novel restraining device that is relatively easily and quickly applied and removed and capable of automatic adjustment in assuring adequate securement and patient comfort.

Still another object of the present invention is to provide a novel restraining device including a band adapted to encircle the part of the body anatomy desired to be restrained in such a fashion that circumferential pressure is substantially avoided when tension is not applied thereto by the patient in an effort to free himself.

Yet another object of the invention is to provide a novel restraining device which applies no pressure to the restrained

body part as long as the patient is quiet, and pressure occurs only when the patient tries to get loose.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of the novel restraining device of the present invention illustrated in a typical application for restraining an extremity or limb of a patient;

FIG. 2 is a plan view of the restraining device employed in the patient restraining application of FIG. 1;

FIG. 3 is a side elevational view of the restraining device;

FIG. 4 is a transverse cross-sectional view of the restraining device as taken in the direction of arrows 4-4 of FIG. 1;

FIG. 5 is a plan view of another embodiment of the present invention employing two attachment straps;

FIG. 6 is a side elevational view of the restraining device embodiment shown in FIG. 5; and

FIG. 7 is a sectional view of the restraining device shown in FIGS. 5 and 6 illustrated in a typical restraining application.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, the novel restraining device of the present invention comprises a flexible member or band 11 forming a cushion member and having a thin outer layer of plastic 12 carrying an inner protective layer 13 on one side thereof, such as sponge rubber or other soft compressible material. It is understood that any suitable cushion band construction can be utilized. The protective layer 13 is intended to be applied against the skin of the body extremity desired to be restrained, such as a wrist 14 of a patient. The exterior surface of the band 11 carries a strap means 15 adapted to be encircled about the band 11 when it is wrapped about wrist 14 and is inserted through a ring 16 pivotally carried on the band so as to provide an extension portion 17 of the strap. The free end of the strap portion 17 includes a fastener 18 intended to be releasably connected to supporting structure, such as a bed rail 20.

As illustrated in FIGS. 2 and 3, fastener or closure means are provided for joining the opposite ends of the band 11 together about the patient's wrist which takes the form of a hook and pile fastener comprising cooperating closure elements 21 and 22 on opposite sides of band 11. Such a hook and pile fastener is referred to in the industry as a Velcro-type fastener and information pertaining thereto may be obtained from the Velcro Corporation, New York, New York. When pressed together, the hooks and loops on opposite closure elements engage creating an adjustable, highly versatile and secure closure. For opening, the elements are simply peeled apart. It is noted that the closure element 21 is carried near one end of the band 11 on the plastic layer 12 while the closure element 22 is carried on the cushion material 13 at the opposite end of the band 11. This arrangement ensures that the closure elements will be placed in opposing relationship when the band 11 is wrapped about the body extremity intended to be restrained and that no portion of the fastener will touch or contact the skin of the body extremity. The length of the band and enclosure elements are selected so that the band can encircle various sizes of body portions and still permit fastening of the closure elements in comfortable contact with the body portion.

As further shown in FIGS. 2 and 3, the ring 16 is pivotally coupled to the band 11 by passing portion 23 of the ring through a loop 24 formed by doubling over the extreme end of strap 15. The doubled-over end of the strap is secured to the band by means of stitching 25 so that the ring 16 is disposed between the opposite ends of the band 11. In a similar fashion, the fastener 18 is secured to the end of strap portion 17 by means of loop 26 encircling a portion of fastener 18 and

secured by means of stitching 27. Preferably, the strap 15, including its integral extension 17, is fabricated from canvas, nylon cloth or the like. The fastener 18 is of a type including a snap action by means of a latch 28 resiliently biased to a closure position against a hook 29, but, of course, could be any other suitable type of fastener.

Referring now in detail to FIG. 4, it can be seen that the band 11 is wrapped about the limb 14 so that the soft compressible material of cushion 13 resides against the skin of the limb. Fit of the band about the limb may be made comfortable by means of the Velcro fastener closure elements 21 and 22 so that the band is touching the limb without substantial pressure thereon. The strap 15 substantially encircles the wrapped band adjacent its exterior surface extending from the loop 24 above the closure elements 21 and 22 and then through the central opening of ring 16 where the strap portion 17 extends outwardly to a supporting or restraining structure. As an example of stress distribution during a patient's attempt to free himself, substantial force is initially developed in the direction of arrow 30 which causes a tightening of the band about the limb. Such action may cause a slight distortion of the band diameter at the location adjacent the strap 15. The harder the patient pulls, the greater the tightening or squeezing force of the band on the limb of the patient. The patient soon learns that as long as he is quiet, no squeezing pressure on the limb is present and that the band 11 is comfortable about the limb. It is pointed out that when a force is applied to strap 17 by the patient, the force of the strap is in the direction to squeeze the closure elements together rather than pull them apart. Therefore, there is no tendency to remove the band 11 from the limb because of the pulling force.

Another embodiment of the present invention is illustrated in FIGS. 5—7 inclusive wherein an elongated band 35 is employed similar to the band 11 of FIG. 1 in that a layer of plastic 36 is utilized carrying a soft compressible material such as foam rubber 37. A first strap 38 is secured to the plastic layer 36 by means of spaced apart stitching 40, 41 and 42. The first strap 38 resides substantially along the central longitudinal center line of the band 35 and terminates in a loop 43 for pivotally retaining a ring 44 substantially near the end of the band 35. Stitching 40 secures the loop end of the strap to secure the ring 44 thereto as well as to secure the strap to the band 35.

Strap 38 extends beyond the opposite end of band 35 from its end terminating in ring 44 and is represented by numeral 45 which terminates in a looped end 46 for securing a fastener 47 similar to the fastener 18 shown in connection with the embodiment of FIG. 1. A second strap 48 is secured on top of strap 38 and to the band 35 by stitching 42 so that straps 48 and 45 reside on top of one another except that their free ends are available for separation and connection to or with separate or supporting structure. The end of strap 48 opposite from its end stitched at 42 is provided with a looped end 50 for pivotally securing a fastener 51 similar to the fastener 47.

It is to be particularly noted that the length of major strap 45 is substantially longer than the second or intermediate strap 48. This relationship is more clearly shown with respect to FIG. 7 in which the restraining device is illustrated in a typical application for restraining a portion of a patient's body, such as his torso, indicated by numeral 52. The intermediate strap 48 is releasably coupled to the restraining structure, such as a bed rail 53 on one side of the bed, while strap 45 is encircled or trained about the anatomy and then passed through ring 44 and secured to a bed rail 54 on the other side of the bed. For clarification, strap 45 may be defined as engaging one side of the patient's anatomy via a strap segment 55, passing beneath the patient as indicated by strap segment 56 and extending upwardly on the opposite side of the patient as represented by strap segment 57. As indicated in broken line

45', the strap 45 is tensioned to effect retention of the patient as the patient moves on the bed or table.

The operation of the inventive embodiment shown in FIGS. 5—7 is similar to the operation of the embodiment shown in FIGS. 1—4. The patient may have complete freedom when no force is being placed on the straps. When strap 45 is tensioned, the strap 45 and the band 35 are tightened or squeezed about the torso to indicate to the patient that his movement is being restrained and the harder he pulls, the greater the squeeze and the more conscious he becomes of the restraint. The patient soon learns that he is more comfortable when not attempting to move against the restraining force.

Accordingly, modifications of the invention may be resorted to without departing from the spirit hereof or the scope of the inventive claims.

I claim:

1. A restraining device for a portion of a patient's body comprising:

an elongated flexible cushioning member normally comfortably secured about said body portion;
a flexible strap secured at one of its ends to said cushioning member;

a ring pivotally carried on said secured end of said strap; fastener means carried on the free end of said strap for releasable attachment to a supporting structure; and
said strap being adapted to encircle said cushioning member when applied to said body portion and to be passed through the opening of said ring so as to extend from said ring to the supporting structure such that a force placed upon said strap by said patient causes said strap to tighten about said body portion.

2. The invention as defined in claim 1 wherein said cushioning member comprises a band of soft compressible material wrapped about said portion of the patient's body with its inner surface engageable with the skin of the patient's body.

3. The invention as defined in claim 1 wherein said ring is disposed substantially midway between the opposite ends of said member.

4. The invention as defined in claim 1 including fastener means carried on the opposite ends of said member cooperating to effect closure therebetween.

5. The invention as defined in claim 4 wherein said secured end of said strap is disposed substantially midway between the opposite ends of said member and includes a formed loop for pivotally holding said ring.

6. The invention as defined in claim 5 wherein said strap lies along the longitudinal center line of said member between the opposite edges of said member and wherein the width of said member is substantially greater than the width of said strap.

7. The invention as defined in claim 1 wherein said cushioning member comprises a layer of sheet plastic having a layer of soft compressible material carried thereon adapted to engage the skin of the patient's body; said secured end of said strap and said ring is disposed adjacent a selected end of said cushioning member; and said strap extends over the opposite end of said cushioning member to encircle said body portion and extend through said ring.

8. The invention as defined in claim 7 including a second elongated flexible strap of shorter length than said first mentioned strap; and fastener means carried on the free end of said second strap for releasably securing said second strap to a supporting structure.

9. The invention as defined in claim 8 wherein said second strap is secured in common at one of its ends to said first strap and said cushioning member adjacent the end of said cushioning member opposite to its end carrying said ring.

10. The invention as defined in claim 9 wherein said first mentioned strap is secured to said cushioning member at the opposite ends of said cushioning member and at the middle of said cushioning member.