Sept. 1, 1964 P. VON FRANTZIUS 3,146,614

THUMB CUFF

Filed Sept. 4, 1962

Fig. 1

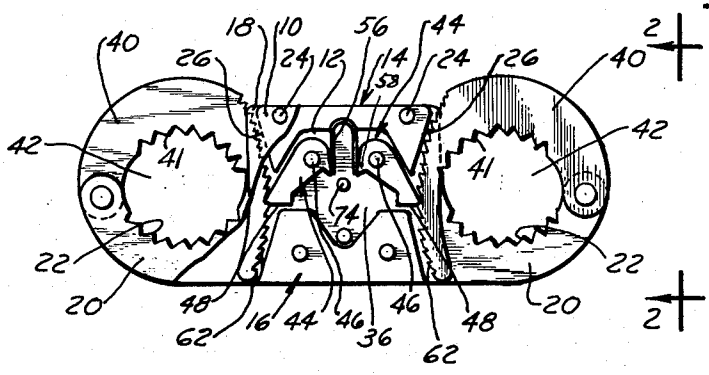


Fig. 2

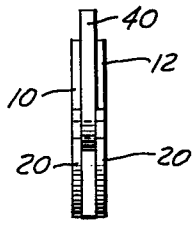


Fig. 3

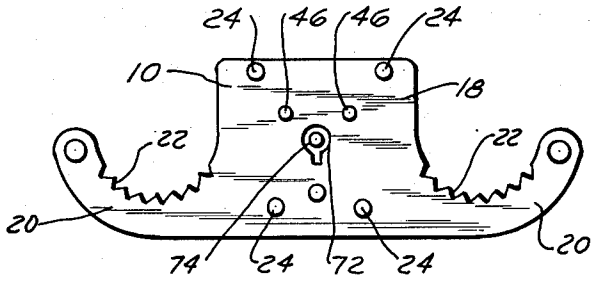


Fig. 4

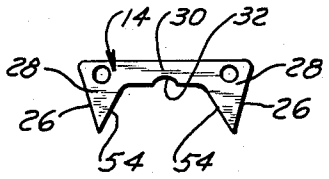


Fig. 5

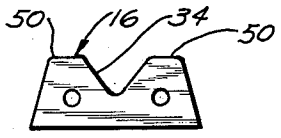


Fig. 7

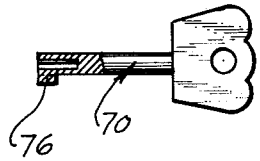


Fig. 6



INVENTOR.
PETER VON FRANTZIUS
BY Norman P. Zerlach
ATTORNEY

United States Patent Office 3,146,614 Patented Sept. 1, 1964

3,146,614

THUMB CUFF

Peter von Frantzius, Chicago, Ill., assignor to Sports, Inc., Chicago, Ill., a corporation of Illinois

Filed Sept. 4, 1962, Ser. No. 221,154
2 Claims. (Cl. 70—16)

The present invention relates to a manacle and has particular reference to a bilateral manacle intended specifically for use in imprisoning the thumbs or other fingers of a person, such a manacle being commonly referred to as a thumb cuff. In general, it may be stated that a thumb cuff of the type with which the present invention is concerned possesses numerous features of advantage over a wrist and ankle manacle in that it is of such small proportions and sufficiently light that it may not be used by a prisoner as a weapon. Additionally, by reason of its compactness, one or more such manacles may readily be carried by an officer, or other person having authority, without encumbrance and in a concealed manner.

The invention is specifically concerned with that type of thumb cuff which embodies two mating plates having spaced curved thumb-engaging arms at the opposite ends thereof, the two plates being maintained in their spaced relationship by means of spacer blocks, which, in combination with the plates, provide an internal mechanism-enclosing chamber. Reentrant thumb-engaging levers are pivoted at the outer ends of the curved arms, and are likewise curved and capable of operating between the respective spaced arms to provide variable-sized thumb-receiving openings. Two spring-pressed pawls within the chamber coact with the thumb-engaging locking levers to maintain the same in predetermined locked positions. A key, which is receivable through a keyhole in one of the plates, is selectively engageable with the pawls so that, as the key is turned in one direction, it releases one of the levers and as it is turned in the other direction, it releases the other lever. Thumb cuffs of this general type are well known. They are patterned after the larger so-called handcuffs, of which they are merely miniatures. Such thumb cuffs are possessed of one serious limitation, namely, that the variable-sized apertures afforded by the spaced arms and their respective thumb-engaging levers are frequently not securely closed about the imprisoned thumbs so that it is possible for the prisoner to release one or both thumbs with or without the aid of saliva lubrication. Another limitation that is attendant upon the construction of such thumb cuffs is the possibility of fouling of the key against the pawls, especially if the spring which biases the pawls has become weakened.

The present invention is designed to overcome the above-noted limitations that are attendant upon the construction and use of conventional thumb cuffs of the type outlined above and, accordingly, it contemplates the provision of a novel thumb cuff having serrated or toothed thumb-engaging edges on either the spaced thumb-engaging arms, on the thumb-engaging levers, or on both of these elements so that less locking pressure is required securely to capture to thumbs of the prisoner than ordinarily would be the case in the absence of such serrated edges. The invention further contemplates a novel spring arrangement for biasing the pawls, and also the provision of a novel pawl abutment so that there will be no fouling of the key against the pawls as aforesaid.

The provision of a thumb cuff possessing the features of novelty set forth above being the principal object of the invention, other objects and advantages will become readily apparent as the following description ensues.

In the accompanying single sheet of drawings forming a part of this specification, one illustrative embodiment of the invention has been shown.

In the drawing:

FIG. 1 is a front elevational view of a thumb cuff constructed according to the present invention, with a portion of the casing structure removed to more clearly reveal the nature of the invention;

FIG. 2 is an end sectional view of the structure shown in FIG. 1;

FIG. 3 is a plan view of a front plate employed in connection with the invention;

FIG. 4 is a plan view of an upper spacer block employed in connection with the invention;

FIG. 5 is a plan view of a lower spacer block employed in connection with the invention;

FIG. 6 is a plan view of a pawl employed in connection with the invention; and

FIG. 7 is a side elevational view, partly in section, of a key employed for unlocking the levers of the thumb cuff.

Referring now to the drawing in detail, the thumb cuff of the present invention involves in its general organization front and rear side plates **10** and **12**, respectively, which are maintained in slightly spaced relationship by means of upper and lower spacer blocks **14** and **16**, respectively. The two side plates **10** and **12** are similar in their construction and each includes a generally square medial body portion **18** and from which there project laterally in opposite directions in the lower region thereof a pair of thumb-engaging cradle arms **20**. The cradle arms **20** are of arcuate design and the inner curved edges thereof are serrated to provide a series of friction teeth **22**. The two plates and the two spacer blocks are maintained in their assembled relationship by means of rivet posts **24**, two such posts passing through each spacer block.

The upper spacer block **14** is of relatively flat construction and is provided with downwardly and inwardly tapered side edges **26** (FIG. 4), which constitute the outside edges of a pair of generally triangular enlargements **28** which are connected together by a narrow neck portion **30**. The lower edge of the neck portion **30** is provided with an arcuate recess **32** which constitutes a spring seat as will be described presently. The lower spacer block **16** likewise is relatively flat and is generally in the form of a trapezoid, the upper edge of which is formed with a V-shaped recess **34**.

The two spacer blocks **14** and **16** are positioned between the body portions **18** of the side plates **10** and and **12** so that, in combination with these side plates, they afford an internal chamber **36** which, as it appears in the front view of FIG. 1, is generally of pentagonal construction.

Pivoted between the extreme end regions of each pair of spaced cradle arms **20** for swinging movement in the general plane of the thumb cuff as a whole is a thumb-engaging clamping arm **40** having friction teeth **41** thereon adapted to oppose the friction teeth **22** on the cradle arms **20**. The arms **40** are of curved design and are designed for cooperation with the cradle arms **20** in reentrant fashion so as to provide, in combination with such cradle arms, a pair of thumb-receiving openings **42** which are of variable size, depending, of course, upon the position of the clamping arms **40**. In the free state of the thumb cuff, the clamping arms **40** are capable of swinging movements in a downward direction through or between the spaced cradle arms **20** and of continuing their swinging movements throughout a full 360° angle but they are restrained against reverse or upward swinging movement between the cradle arms by means of respective pawls **44** which are pivoted on cross pins **46** which extend between the two plates **10** and **12**. The two pawls **44** are identical in their configuration but are reversed as to position, and each pawl serves one of the clamping arms **40** to prevent reverse swinging movement

thereof. Each pawl 44 is provided with a distal end edge 48 (see FIG. 6) designed for engagement with a straight edge portion 50 on the lower spacer block 16 to limit the downward swinging movement of the pawl, and with a side edge 52 designed for engagement with a straight edge portion 54 provided on one of the triangular enlargements 28 on the upper spacer block 14 to limit the upward swinging movement of the pawl. A U-shaped spring 56 has its bright portion seated within the spring seat or recess 32 of the upper spacer block 14, and the parallel arm portions of the spring bear outwardly in opposite directions against respective extensions 58 formed on the pawls 44, as best seen in FIG. 1. The two pawls 44 are thus urged by the spring 56 against the respective edges 54 of the enlargements 28 and determine the normal positions of these pawls. Each pawl 44 is provided with an effective ratchet-engaging finger 60 at the distal end thereof, the finger being designed for cooperation with a series of ratchet teeth 62 provided along the outside curved edge of one of the clamping arms 40 and extending an appreciable distance inwardly from the free end of the arm.

Release of the clamping arms 40 by the pawls 24 is adapted to be effected under the control of a key 70 (see FIG. 7) capable of being inserted through a keyhole 72 provided in the front side plate 10 (see FIG. 3) and adapted to be piloted on a pin 74 on the rear side plate 12 in register with the keyhole 72. When the key 70 is thus piloted on the pin 74 and is turned in a clockwise direction, as viewed in FIG. 1, a pawl-engaging projection 76 on the key engages the extension 58 of the left pawl 44 and swings the pawl in a counterclockwise direction to withdraw the ratchet-engaging finger 60 from contact with the ratchet teeth 62 of the adjacent clamping arm 40 and thus release the arm. Similarly, when the key 70 is thus piloted and is turned in a counterclockwise direction, as viewed in FIG. 1, the projection 76 engages the extension 58 on the right pawl 44 and swings the pawl in a clockwise direction to withdraw the ratchet-engaging finger 60 from contact with the ratchet teeth of the adjacent clamping arm 40.

It is to be noted at this point that by reason of the straight edge portions 50 on the lower spacer block 16 and the cooperating end edges 48 of the pawls 44, the extent of movement of which the pawls are capable under the influence of the key 70 is limited so that it is not possible for the key projection 76 to over-run the pawls and by so over-running them, releasing the pawls inadvertently during an unlocking operation. The tension of the spring 55, is not relied upon to prevent such over-running of the key, and the edges 50 afford positive limit stops so that the key 79 may not be turned in either direction beyond a predetermined angle.

The two sets of thumb-engaging teeth 22 and 41 on the cradle arms 20 and clamping arms 40, respectively, lessen the degree of tightening operation which must be performed upon the clamping arms 40 in order to preclude escape of the thumbs from the variable openings 42. Whereas, in the absence of such teeth an appreciable degree of pressure against the skin is required to prevent escape, where the teeth are provided, only a moderate degree of pressure is required since the teeth offer frictional characteristics that result in considerable pain when attempts are made to force the openings 42 over the enlarged finger joints.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit or scope of the invention. Therefore, only insofar as the invention has particularly been pointed out in the accompanying claims is the same to be limited.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A thumb cuff comprising a pair of closely spaced parallel side plates provided with oppositely directed curved cradle arms at the opposite ends thereof, upper and lower vertically displaced spacer blocks disposed between said side plates and serving to maintain the latter in their closely spaced relationship, said spacer blocks and side plates defining an internal operating chamber, curved clamping arms pivotally connected to the distal ends of said cradle arms and capable of reentrant swinging movement in opposite directions respectively between the cradle arms to define in combination therewith two variable-size thumb-engaging openings, a pair of latching pawls pivotally mounted within said operating chamber, ratchet teeth on said clamping arms and movable into locking relation with respect to said pawls during reentrant swinging movement of the clamping arms, a spring disposed within said chamber, having a bight portion seated within a recess provided in the upper spacer block and having substantially parallel spring arms bearing against said pawls for urging the same outwardly into operative engagement with the ratchet teeth on the clamping arms, the upper spacer block having portions disposed in the paths of movement of the pawls to limit the outward movement of the latter, the lower spacer block having portions disposed in the paths of movement of the pawls to limit the inward movement of the latter, and projections on said pawl selectively engageable with a key for moving the pawls out of locking relation with said ratchet teeth.

2. A thumb cuff as set forth in claim 1 and wherein said cradle arms and said clamping arms are formed with cooperating thumb-engaging teeth on the inside surfaces thereof and arranged in opposition when the cradle arms are swung to their reentrant positions.

References Cited in the file of this patent

UNITED STATES PATENTS

929,910	Wood	Aug. 3, 1909
1,746,890	Gill	Feb. 11, 1930