Nov. 2, 1965 W. J. LITWIN 3,214,808

HOLDER BAND

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FIG. 1

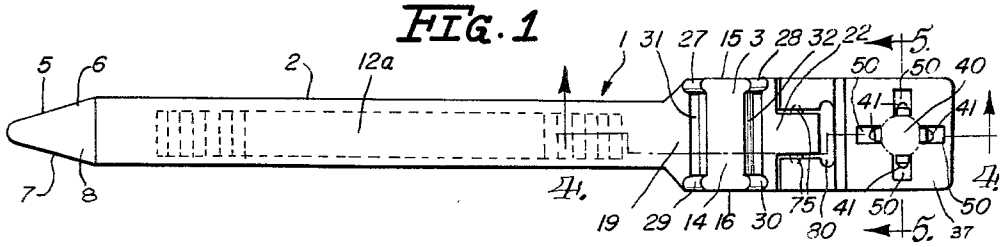


FIG. 2

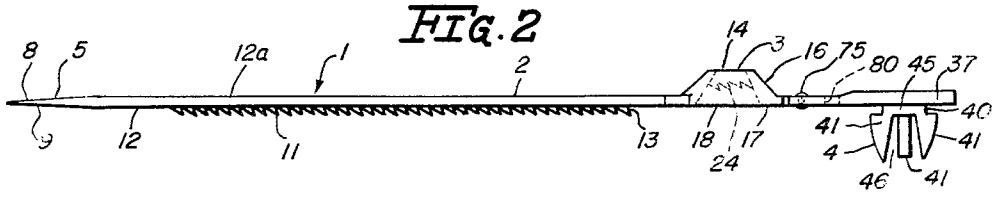


FIG. 3

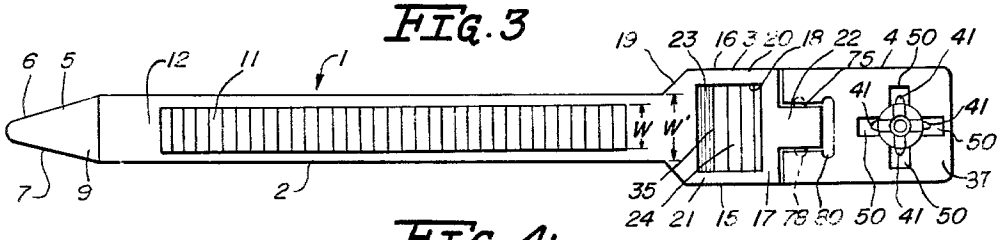


FIG. 4

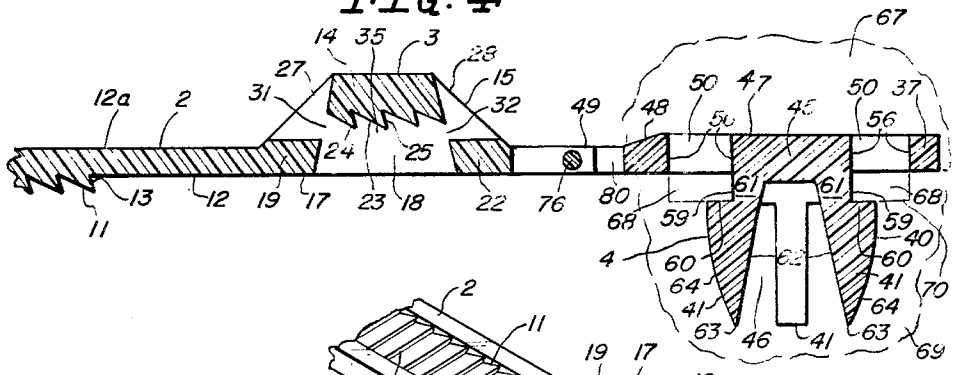


FIG. 5

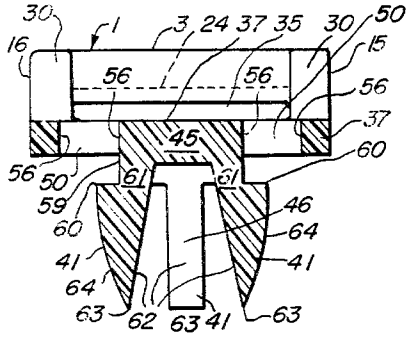
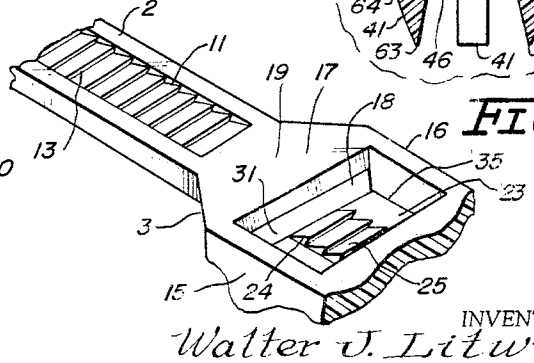


FIG. 6



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FIG. 7

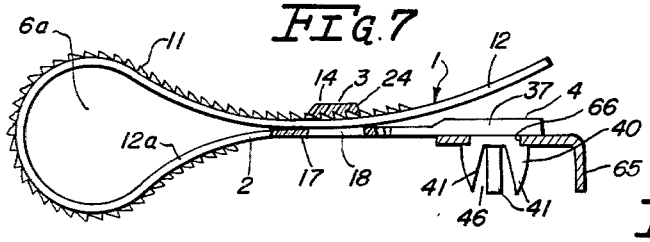


FIG. 8

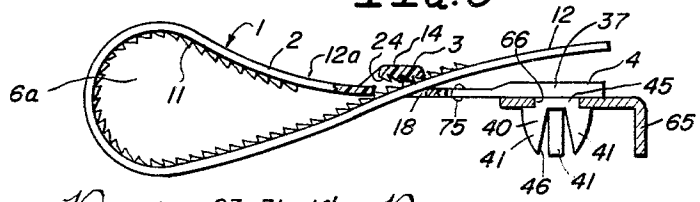


FIG. 9

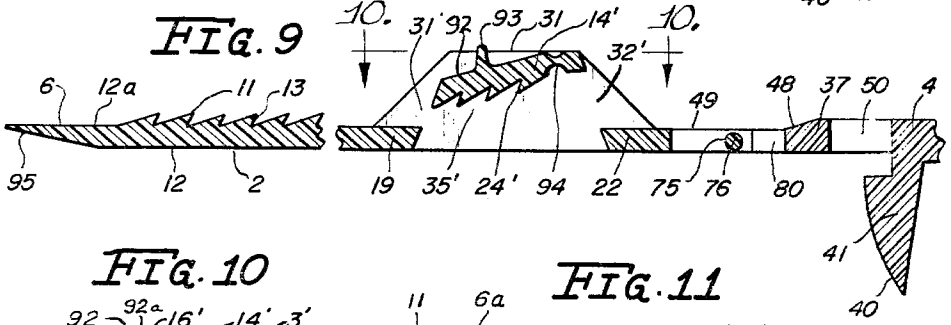


FIG. 10

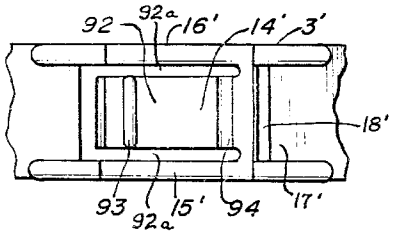


FIG. 11

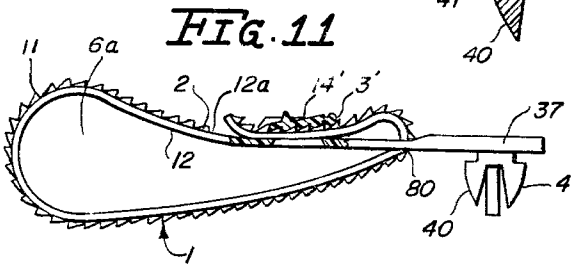


FIG. 12

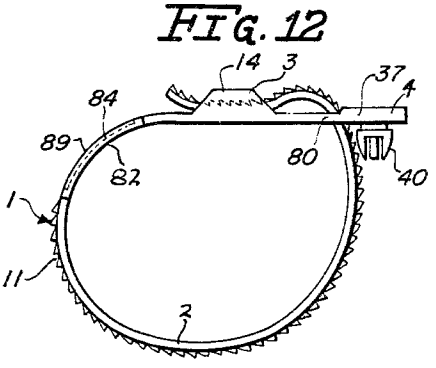


FIG. 13

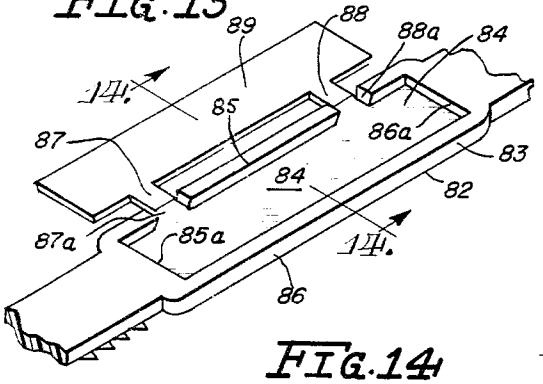
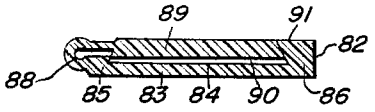


FIG. 14



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3,214,808
Patented Nov. 2, 1965

3,214,808

HOLDER BAND

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Filed Aug. 15, 1962, Ser. No. 217,073
2 Claims. (Cl. 24—16)

This invention relates to a holder band or clamp means and in particular relates to locking structure for maintaining the holder band or clamping structure in a loop and for fastening means for fixing or mounting the holder band or clamping structure to an associated object or surface.

It is therefore a general object of this invention to provide a novel holder band or clamping structure in the form of a loop for holding or containing an object therein which may be suitably identified or labeled.

Another object of this invention is to provide a novel holder band or clamping structure having a novel locking action and which may optionally be provided with fastening structure for securing the object against movement.

Another object of this invention is to provide a novel holder band or clamping structure which is designed for easy assembly into a loop structure and held there in a locked position by novel interlocking means.

Another object of this invention is to provide a novel holder band or clamping structure carrying a fastening element which easily and quickly couples the holder band or clamping structure to an associated object.

A further object of this invention is to provide a holder band or clamping structure which has a novel interlocking structure for holding the band or clamping structure in a loop and preventing disengagement of the loop structure.

Still another object of this invention is to provide a novel holder band article or clamping structure that may be readily and easily manufactured by die casting structure.

Still a further object of this invention is to provide a flexible holder band or clamping structure, which because of its elastic nature provides a fast, snapping or locking action of the interlocking mechanism and also provides a fast or snappy locking action of associated fastening structure located on the holder band or clamping structure.

Still a further object of this invention is to provide a novel flexible band or clamping structure in the form of a loop and carrying suitable identification means for identifying the object or objects which it encompasses.

Another object of this invention is to provide a flexible holder band or clamping structure having a novel interlocking structure in the form of interengaging teeth which teeth may be recessed within the strap portion of the holder band so as not to scratch or abrade adjoining and associated structure.

A still further object of this invention is to provide a holder band or clamping structure having a buckle portion and a strap portion wherein the buckle portion is provided in conjunction with the strap portion novel interlocking mechanism.

These and other objects will become more apparent with reference to the following description and accompanying drawings. However, it is to be understood that

the disclosure of the preferred embodiment illustrated by the description and drawings is not meant to be a limitation upon the breadth and scope of the appended claims, to wit:

FIGURE 1 is a plan view of my novel holder band with its novel fastening unit;

FIGURE 2 is a side view of the novel holder band or clamping unit;

FIGURE 3 is a bottom view of said novel holder band and clamping unit with the fastening element as discussed above;

FIGURE 4 is a sectional view taken substantially along line 4—4 of FIGURE 1;

FIGURE 5 is a section view of the novel holder band and clamping unit taken substantially along line 5—5 of FIGURE 1;

FIGURE 6 is a sectional view of the underside of the holder band and clamping unit showing the teeth of the locking mechanism recessed and illustrating a reverse draft of the teeth;

FIGURES 7 and 8 illustrate several positions that the holder band and clamping unit may take in forming a loop;

FIGURES 9, 10, and 11 are sectional views of the novel holder band and clamping unit employing novel interlocking structure to prevent disengagement of the tongue portion from the buckle portion, FIGURE 10 being taken along line 10—10 of FIGURE 9;

FIGURE 12 is a view of the novel holder having the strap teeth on the topside and being provided with an identification tag container;

FIGURE 13 is an enlarged sectional view in perspective of the identification tag container; and

FIGURE 14 is a sectional view taken along line 14—14 of FIGURE 13.

It will be seen from the drawings and the following description that the holder band and clamping unit consists of a strap portion and a buckle portion wherein the strap portion may be looped through the buckle portion in one of a variety of ways and so held by novel interlocking structure and wherein novel fastening means may be optionally coupled to one end of the band or clamping structure for holding the band or structure against movement. Because of such novel construction it will be seen that the holder band or clamping unit may be used to hold a number of strands or it may be used about the arm of a person as an identification tag or bracelet and the provision of the fastening means prevents movement of the cables or the arm when secured to a suitable associated surface.

This holder band or adjustable clamp mechanism is an improvement of my Holder Band or Adjustable Clamp Unit in my copending patent application having U.S. Serial No. 833,206 and filed August 12, 1959, now Patent No. 3,049,771.

With reference now to the drawings, there is shown a holder band or adjustable clamp structure 1 having a strap portion 2, a buckle portion 3, and a fastening portion 4. The strap or tongue portion 2 consists of an elongated thin section having a tapered tip part 5, as shown in FIGURE 1, having sides 6 and 7 that taper outwardly and having top and bottom surfaces 8 and 9 that also taper outwardly as shown in FIGURE 2, the tongue

portion 2 being threaded through the buckle portion 3, as shown in FIGURES 6, 7, 11, and 12. The strap or tongue portion 2 has a series of teeth 11 extending along its longitudinal length and on the tongue portion underside 12 in FIGURES 2, 3, 4, 6, 7, and 8 and on the tongue portion topside 12*a* in FIGURES 9, 11, and 12. These teeth project outwardly of the tongue portion 2 and have a width *w* less than the width of the tongue or strap portion *w'* (see FIGURE 3). It will be noted that the teeth 11 have an outwardly extending surface 13 that is somewhat normal to the tongue portion but angled toward the buckle portion 3 defining a back draft or reverse draft to be later explained.

The buckle portion 3 consists of a top wall or roof portion 14, side walls 15 and 16 and a bottom wall 17 having an aperture 18 therein and dividing the bottom wall portion 17 into a tongue connecting section 19, side sections 20 and 21, and a forward extending or fastener connection section 22. The top wall portion on its inner side 23 has a plurality of teeth 24 extending downwardly toward the aperture 18, each of the teeth having a downward extending surface 25 (FIGURES 4 and 6) presenting a back draft or reverse like that of surface 13 of the teeth 11 and directed in the same direction as that of the teeth 11. It will be noted in FIGURES 1 and 2 that the walls 15 and 16 slope from the top wall 3 downwardly and outwardly to merge with the portion 19 of the tongue or strap portion and with the fastener portion 22. Because of such construction of the side walls 15 and 16, side wall rib sectors 27, 28, 29, and 30 (FIGURE 1) are formed and lend strength and support to the buckle portion and also guide the tongue portion through the opening or entrance 31 (FIGURES 1 and 4) and the opening or exit 32 (depending on which direction tongue 2 is fed into buckle 3), the entrance and exit areaways 31 and 32 allowing passage of the tongue or strap portion 2 of the holder band or clamp structure through the buckle 3 and permitting engagement of the teeth 11 with the teeth 24, the back draft surface 13, 25 of these respective teeth 11 and 24 preventing disengagement of the tongue portion within the pasage 35 of the buckle portion 3 and yet upon force being applied while the strap 2 is in the passage 35, the entrance and exit portions 19, 22 or 22, 19 of the bottom wall 17 are permitted to be flexed downwardly, as the material is of a suitable plastic or elastomeric material, and allow disengagement of the teeth 11 of the strap portion 2 from the teeth 24 of the buckle portion 3. It will be noted that in FIGURE 8, the strap 2 may be fed through the aperture 18 and threaded through the passage 35 and opening 32. Thus it is seen by the arrangement of the toothed top wall 14 and the tab portions 19, 22 of the bottom wall 3, in combination with the aperture 18 and the entrance and exit openings 31, 32 and the passage 35, the strap portion is allowed to be fed and locked in place as shown in FIGURE 7 or FIGURE 8. The arrangement as shown in FIGURE 7 allows the teeth to be on the outside and an arm or bundle of cables to be within the loop 6*a*, whereas in FIGURE 8 the teeth 11 are on the inside if it is desired to grasp and hold the cables in a more locked position with the aid of the teeth 11. The interlocking of the teeth 13 and the teeth 24 each having a respective back draft permit a good locking action, particularly since the vertical thickness of the strap portion including the vertical extent of the teeth 11 leave little or no vertical movement of the strap in the passageway 35 and disengagement is only possible by exertion of the strap portion downwardly against the tab portions 19 and 22.

The fastening portion 4 extends from the bottom wall sector 22 of the buckle portion 3 and has a flat longitudinal horizontally extending flexible strip 37 from which depends downwardly in a direction opposite to the upwardly extending buckle side walls and top portion, a plug or protuberance 40. The plug or nipple or nub 40 is defined by a series of four downwardly extending flange sections 41, placed at approximately 90° with respect to one another and merge into a base part 45 of portion 37 and define a central cavity 46 between them. The portion 37 has a top wall 47 that is continuous with a downwardly taping surface 48 that merges to connect with the top surface 49 of the bottom wall 17 of the buckle portion 3. The longitudinally extending wall 37 of the fastening portion is provided with a plurality of rectangularly shaped apertures 50, which are spaced apart from one another at approximately 90° and are in general vertical alignment with a portion of each of the respective flanges 41. Each of these apertures 50 and flanges 41 are identical to each other aperture and flange respectively. Each aperture has vertical walls 56, one wall 56 being continuous with the downwardly extending wall 59 of each flange 41, the wall 59 intersecting at right angles with the horizontal wall 60 of the flange 41 and defining a thin section 61 with the divergingly tapering downward extending surface 62 of the flange 41, the wall 61 merging in an apex 63 with the concave wall 64 of the flange 41, said wall 64 joining with the wall 60, so as to define the somewhat triangularly shaped flange section 41 connected to the base 45 by the section 61. The tapered wall 62 of each of the flanges 41 permits these flexible flanges 41 to converge toward one another upon application of pressure thereto without the engagement of their respective walls 62 and the curved surface or wall 64 in combination with the apex 63 allows insertion of the plug 40 into a suitable opening 66 in a wall or other member 65, the thin section 61 of each of the flanges permitting or aiding flexure of the flanges toward one another, whereas the curved surfaces 64 allow and aid passage of the plug 40 to the opening 66 in the member 65.

The aperture 46 permits flexure of the flanges 41 inwardly and outwardly of one another in that the wall portions 59 are free to move inwardly toward one another, and the apertures 50 permit an instrument to be passed therethrough for angling or adjusting or moving a respective flange to aid in passage of the flange through the opening 66. Further, this type of a plug is simple to manufacture through a normal die casting type operation where, as shown in FIGURE 4, the upper die part 67 may have downwardly projecting lugs 68 to form each of the apertures 50 and the walls 56 of the plug 40 and then another die 69 which has a mating or parting line 70 with the die 67 can make the lower flange portions 41. Thus it can be seen that the construction of the plug 40 itself lends to easy manufacture by a die casting arrangement because of the use of the holes 50. The taper 48 of the fastening unit allows the tongue or tip portion 5 of the strap 2 to come out of the passage 35 without being obstructed by the fastening portion 4 itself.

The teeth 11 may protrude outwardly as shown in FIGURES 1 through 5, or they may be recessed as shown in FIGURE 6 if the surface of the strap or tongue portion is to be smooth and, therefore, the teeth 25 in the top wall portion of the buckle must protrude outwardly of the inner surface 23 of the top wall surface 14. FIGURE 6 also points out in perspective view the reverse draft of the teeth 11.

It will be appreciated that the fastening portion 4 may be integrated with the strap and buckle portion or it may be an optionally removable fastening portion 4 having hinge connection 75 provided with pins 76 of buckle portion 22 which pins insert into openings 78 in the fastener portion 37 and a slot 80 may be defined between the right end of the bottom wall portion of the buckle and the left end of the fastening portion 37 (see FIGURE 3) in order to permit the tongue portion to pass therethrough as shown in FIGURES 11 and 12. In FIGURE 12, it will be noted that the teeth 11 are shown on the top side 12*a* of the strap or tongue portion 2. This permits the tongue por-

tion 2 to be looped through the opening 80 and then through the opening 32, tongue passage 35 and out the opening 31 in a wristband fashion. Consequently the fastening portion may be removed if it is not desired to be used.

In FIGURES 12, 13 and 14, the tag case 82 is used to hold an identification tag therein in order to identify the type of object that the holder band or adjustable clamp structure 1 surrounds. It may be used for instance to identify a patient in a hospital, or it may be used to identify certain types of wire or cable held by the loop portion 6*a* of the holder band or adjustable clamp 1. It may normally be placed on the holder band or adjustable clamp structure 1 between the buckle portion and the tongue or strap portion, or on the top side 12*a* of the strap portion 2 or on the underside 12 of the strap portion. The identification tag case portion 82 has an elongated rectangular housing or box portion 83 of bottom 84 and sides 85, 86, 85*a*, 86*a* lying in the longitudinally extent of the strap portion 2 and has a pair of flexible arms 87 and 88 hinging the housing 83 to a cover 89 which may be a window of clear plastic. The dimensions of the cover tab or flap 89 are such that they would fit snugly within the recess 90 in the housing 83 and held by lip 91 of wall 86 with the arms 87, 88 folded on themselves in slots 87*a*, 88*a* in wall 85. The flap 89 itself may also be made of a transparent material to enable a viewer to read the writing on a suitable card placed within recess 90 of the identification casing 82.

Referring now to FIGURES 9, 10, and 11, there is shown a modified form of an interlocking action between the teeth of the strap portion 2 and the teeth of the top wall buckle portion 14' and can be applicable to the holder band or adjustable strap of the type where the strap portion or tongue portion is fed into the right side (see FIGURE 11) of the buckle 3' through the opening 80 into opening 32' and the passage 35' and out the opening 31' and wherein the teeth 11 on the strap or tongue portion 2 are on the upper side 12*a* as shown in FIGURES 9, 11 and 12. In this instance, the teeth 24' on the buckle 3' and the teeth 11 on the strap 2 have a reverse draft condition as before described and the top wall portion 14' has a portion of its extent severed from the side walls 15' and 16' having slots 92*a* and 92*b* to provide a flap structure 92 which has a tab 93 mounted on its top side and has teeth 24' mounted on its underside and rearwardly of the teeth the vertical thickness of the top wall portion is reduced by notch 94, this permitting flexing of the flap or top wall portion 92 downwardly, such flap 92 being die cast in a downwardly flexed position. When the tongue portion 2 is fed through the passage 35' and over aperture 18' in bottom wall 17' of buckle 3' in the manner described and to an extent desired to form a desired loop, the teeth 11, 24' of the strap 2, and the buckle 3' engage each other and any attempt to withdraw the strap 2 to the right or out through opening 32' would be prevented because of the combination of the reverse draft of the teeth 11, 24' and the downward extending direction of the flap or top wall portion 92. In this respect it will be appreciated that the flap 92 extends down toward the lug 19 to provide a distance less than the thickness of the strap 2, and therefore the strap 2 will slightly raise the flap portion 92. In order to release the flap or roof portion 92 the tab 93 is held in the fingers and lifted upwardly and then the strap or tongue portion 2 may be withdrawn outwardly from the passage 35' and through the opening 32'. It is to be further noted that the tongue tip 6 has a beveled or tapered edge 95 to assist the strap in entering between the lug 19 and top wall portion 92. Ordinarily, it will be appreciated that if the tab portion 93 is not utilized and with the notch condition providing a hinge this flap 92 will give upward when the strap 2 is forced through and will buckle downward in a vice grip when the strap 2 is pulled outwardly for disengagement.

It will be noted that since the teeth 11 on the strap portion 2 project outwardly and are of less width (FIGURE 3) than the strap portion as exemplified in FIGURES 1 through 5, 7, 11 and 12, this permits the flat top or bottom parts of the strap on either side of the teeth to act as runners for allowing suitable wedging means in between the strap portions and buckle teeth 24 to pry these strap portions away from the buckle teeth 24 when teeth 11 are engaged with the teeth 24 without scuffing or damaging the interlocking or engaging portions of teeth 11 and 24.

Thus it is seen that there is provided a flexible holder band or adjustable clamp that is provided with novel interlocking means and with optionally connected fastening structure, the strap portion of the holder band having teeth on either side to provide various types of loops for holding cables or for being fastened about an object and the holder band carrying suitable identification means and wherein the teeth on the strap portion may be recessed to prevent abrading other surfaces and presenting a smooth surface which cannot become ensnarled with other surfaces, the interlocking action between the teeth on the strap portion and on the buckle portion being so interlocked so as to prevent their disengagement but being provided with means for releasing such interlocking action if so desired.

It will be understood that the embodiment heretofore discussed has been chosen to illustrate a preferred form of the invention and is merely in the nature of illustration and not limitation and that the scope of the invention is defined in the appended claims.

What is claimed is:

1. A holder band including a flexible tongue and a flexible buckle associated therewith, said buckle having top and bottom walls and side walls substantially normal to the top and bottom walls and defining a tongue passage therewith, the bottom wall having first and second portions being more highly flexed than the other portions of the buckle and defining an aperture between the first and second portions, the tongue having a juncture of the first portion and having a free end of a width less than the width of the passage and projecting through the passage generally parallel to the top and bottom walls and held in engagement with the top wall by the first and second portions, the buckle top wall and tongue having teeth interengaging with each other, and said first and second portions being temporarily deformable transversely to the principal planes of the top wall for separation of said teeth on the tongue away from teeth on the top wall in accommodation of longitudinal movement of the tongue in the buckle during the deflection, said top wall comprising an elongated part connected at one end to the side walls and being provided with a notch at said one end thereof to permit flexing of said part at said one end for swinging movement toward and away from the tongue within the passage, said part being in alignment with the aperture, said tongue in said passage bridging said aperture and overlaying said first and second highly flexed portions, said elongated part having the other end thereof free and sloping downward toward the first portion of the bottom wall in the relaxed position of the buckle, said part having a tab on its top side and the teeth of the top wall being provided on its underside, said part being deflectible outwardly about the notch upon the movement of the tongue in the tongue passage for complementary interlocking of the teeth on the tongue with the teeth of the top wall.

2. A flexible holder comprising a buckle part and a tongue part integral therewith, said buckle part having a wall generally coplanar with the tongue part at its juncture thereto and having a pair of transverse side webs integral with said wall and having a locking portion spaced from the wall and flexibly connected to said webs for movement transversely of said wall, said wall having an aperture therein in transverse alignment with the locking portion, said tongue part insertable into the buckle

part between said wall and locking portion, said tongue part and locking portion having interengaging teeth, said teeth on the locking portion directed toward said aperture and the teeth on the tongue part extending away from the aperture, said wall having highly flexible portions flanking said aperture and accommodating distortion of the tongue part transversely thereof into the aperture with attendant movement of the locking portion toward the wall.

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