June 19, 1945. J. H. REICHART 2,378,867

SEPARABLE HANDLE AND BAND CLAMP

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FIG. 1

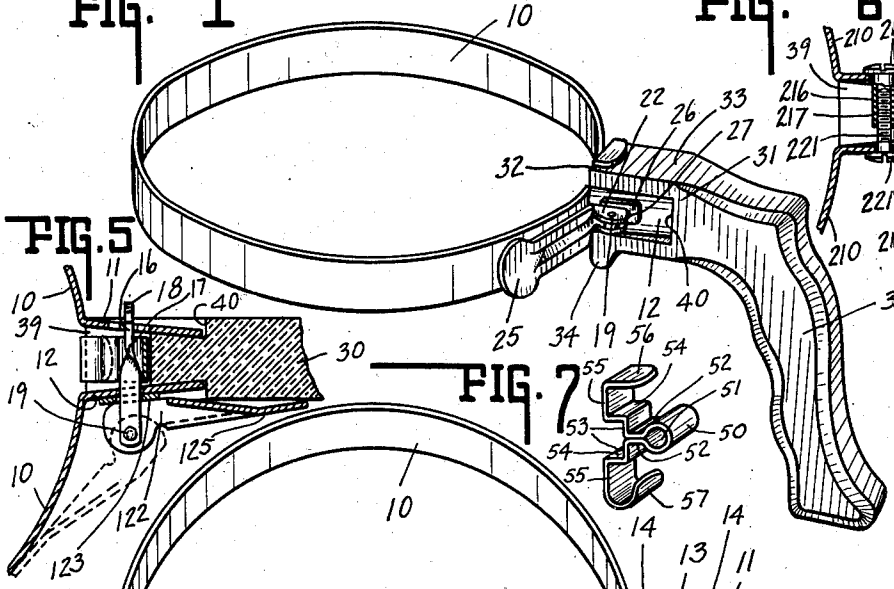


FIG. 6

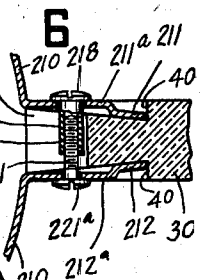


FIG. 5

FIG. 7

FIG. 2

FIG. 8

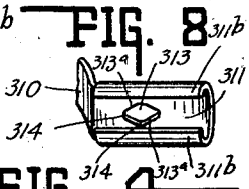


FIG. 4

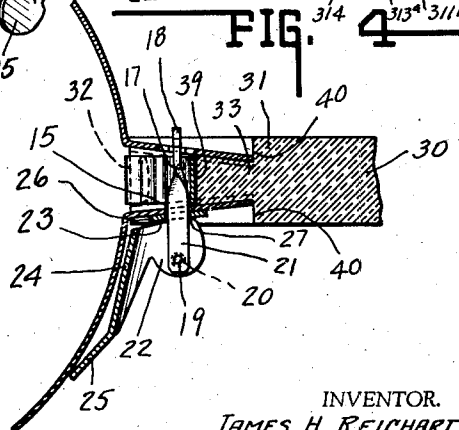
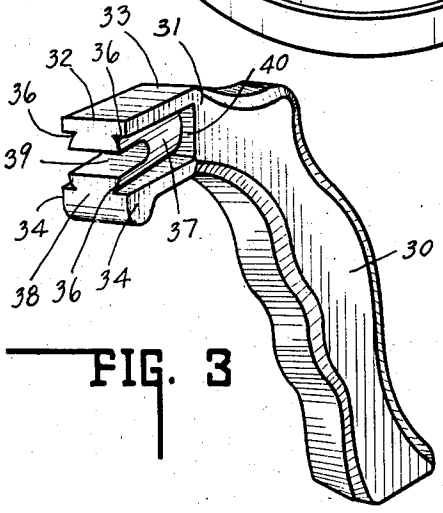


FIG. 3



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FIG. 9

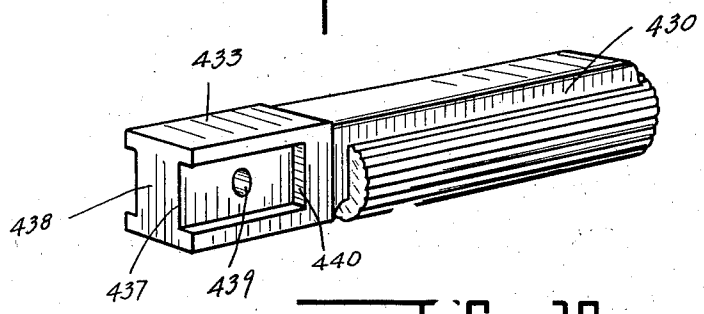
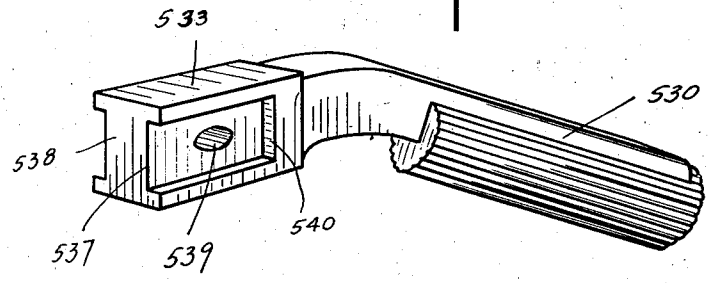


FIG. 10



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SEPARABLE HANDLE AND BAND CLAMP

James H. Reichart, Muncie, Ind.

Application January 21, 1943, Serial No. 473,129

12 Claims. (Cl. 294—27)

This structure relates to a handle type band clamping structure.

The chief object of this invention is to provide a clamping band arrangement, or the like, with a handle, the band portion being arranged for movement into a contracted position for the clamping of an object therein and being releasable for releasing such object from such clamping engagement.

Another chief object of the invention is to provide such a band arrangement with a handle that may be readily attached to and detached from the band.

A further object of the invention is to provide means for quickly and easily moving the band from the released to the clamping position and vice versa, which means is permanently associated with a portion of the band so as to be comparatively inseparably mounted thereon but which is detachably associated with the handle so that the handle may be readily associated with and detached from said band.

The chief feature of the invention consists in the construction of the handle band whereby the aforesaid objects of the invention are accomplished and whereby in addition the strain on the handle and band connection is so applied that increasing strain effects increasing rigidity of association between the band and the handle.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be more fully understood from the accompanying drawings and the following description and claims:

In the drawings,

Fig. 1 is a perspective view of a handle band suitable for the purposes set forth, the handle being illustrated as of pistol grip character and the manually operable control means being illustrated in the band contracting and handle mounting position.

Fig. 2 is a similar view of the band and the control means carried thereby, the handle being omitted and said means being disassociated with one end of the band while carried by the other end thereof.

Fig. 3 is a perspective view of one embodiment of the pistol grip type handle illustrating in detail the connecting portions thereof.

Fig. 4 is a horizontal sectional view through the adjacent ends of the band and the portion of the pistol grip handle associated therewith, the manually operable locking means being illustrated in the clamping position.

Fig. 5 is a view similar to Fig. 4 and of a reverse form of the invention, to-wit, wherein the clamping position of the clamp arm is adjacent the handle.

Fig. 6 is a view similar to Fig. 4 and of a further modified form of the basic invention utilizing a conventional clamping connection.

Fig. 7 is a perspective view of a metallic contact member carried by the clamping structure for purposes set forth hereinafter.

Fig. 8 is a perspective view of a diamond-like opening in the band end adapted for head passage and retention.

Figs. 9 and 10 are perspective views of modified forms of handles.

In the drawings, 10 indicates a band, herein shown substantially circular in outline and the band has two similarly directed ends 11 and 12. Each of these ends 11 and 12 are shown provided with a curved formation, indicated at 11*a* and 12*a*, respectively, in cross section, and the edges thereof are turned inwardly for reenforcement purposes, and the like, as at 11*b* and 12*b*, respectively, see Fig. 2.

The curved formation 11*a* and 12*a* insures rigidity in the end. In other words, it constitutes a stiffening formation. The two beads on each end in conjunction with the intermediate portion form a pair of spaced tongues, as it were, and a groove intermediate the same. The particular special function of the latter will be set forth more fully hereinafter.

The end 11 is provided with an opening 13 and extending longitudinally of the end 11 and from opposite sides of said opening are the oppositely directed slot or wing extensions 14. The portions 14 and central portion 13 form a slot through the end 11 which may be broadly said to be of bayonet or keyhole type in that a headed member may be readily passed longitudinally through the aforesaid opening or slot, and then turned so that the head portion will bear on the external surface of the end and be retained thereby.

The other end 12 of the band is apertured as at 15 and rotatable and slidable longitudinally therein is an enlogated member 16, the same having a twisted portion 17 intermediate its ends and a head 18 similar to the flukes of an anchor. The flukes pass through the portions 14 of the bayonet slot and when the member 16 is turned, for example at 90°, these flukes bear upon the remote face of the end 11, the adjacent face being that closest to the smaller face of the end 12. The elongated member, as stated, extends through the opening 15 and is apertured to re-

ceive a pin 19 having enlarged heads 20 at opposite ends. The portion 21 which is apertured to accommodate the pin 19, is nested between a pair of ears 22 and the enlarged heads 20 bear on the outer faces of said ears. These ears have a cam formation or face 23 and these two ears are joined together as at 24 and the same are extended and terminate in a finger engageable portion 25. There is also provided, if, as and when desired, a hardened washer 26 slotted as at 27 and the same is slidably mounted on the member 16 and bears on the exterior or remote face of the end 12. Preferably slot 27 prevents washer rotation on portion 21.

Whenever the slot or opening in end 12 is of the character illustrated as provided in end 11, it will be obvious that the entire unit, that is, cam clamp and elongated member, may be completely detached from and detachably attached to the band and from either side or end. No illustration of this embodiment is believed necessary. Preferably the connection aforesaid is not of completely separable type.

From the foregoing, therefore, since the preferred opening 15 is of less diameter than the head 18 and since the cam ears are permanently, although pivotally united to the opposite end of the member 16, these connected members including the bearing member 26 are all permanently connected to the band.

The numeral 30 indicates the grip portion of a pistol grip handle having the angular extension 31. This angular extension 31 in plan may be said to be wedge or keystone shaped, that is, its outer end 32 is wider than the innermost portion indicated by the numeral 33. Herein the two side faces 34 each are shown provided with a groove that is comparatively deeper, as at 36, at each side than the central portion 37 of said groove. Thus this formation is substantially complementary to the formation of the band end that is seated in this groove. The resulting stock at its forward end is thus of keystone or wedge shaped, see the immediate left hand portion of Fig. 3.

Extending from the front face 38 or forward end of the handle and rearwardly, is an elongated notch or slot 39 and this extends from one groove to the other and has a length approximately one-half that of the length of the groove, as shown more fully in Figs. 3 and 4.

Whenever it is desired to mount the band upon the handle, the end 12 is seated in the corresponding groove in the handle. The elongated member 16 then is seated in the slot 39 thereof; the other end 11 then is brought into contact with the opposite side of the handle and seats in the corresponding groove. Then the elongated member is passed through that end 11, as aforesaid, and the member is turned at 90° to anchor the member to the end 11. When thus anchored the finger piece 25 is engaged and the cam member is tilted until said finger piece lies adjacent the band, as shown in Fig. 1. Whereupon, the band is rigidly connected to the pistol grip handle. This is the vessel clamping position.

Another method of mounting the band is with the finger grip piece extending substantially parallel to the end 12 and with the head 18 bearing on the exterior of member 11, the two ends 11 and 12 thus forming a channel that can receive the handle grooved end portion 33 if presented between the termini of said ends. Then when these termini following such presentation engage the shoulders 40 of the handle, it will be apparent that the member 16 is fully seated in the elongated slot or notch 39. Then when the finger grip piece 25 is tilted from the position parallel to the end 12 to a position immediately "parallel" to the band, the handle will be locked rigidly to the band in vessel clamping position.

Upon comparison of Figs. 2 and 3, it will be noted that the handle 30, when detached, may be nested within the band 10, whether the ends be connected or detached and hence, be shipped flat or knockdown in a minimum volume container.

It will be observed that relative up and down movement of the band is prevented because the beaded portions of the ends seat in the portions 36 of the handle. It will also be apparent that any attempt of the handle to pull away from and separate from the band, because of the fact that the member 16 is seated in an open ended slot, is resisted for the same is prevented by reason of the wedge or keystone formation shown most clearly in Fig. 4, although it is also illustrated but in perspective in Fig. 3. Any tendency of the band to twist or rotate about the handle is also resisted because the member 16 cannot turn in a direction corresponding to end for end movement.

The handle cannot rock up and down because of the elongated character of the tongue and groove connection. Further, the complementary curved ends clamp the handle stock therebetween in such a manner that rocking as aforesaid also is prevented. As stated, the wedge formation causes drawing of the ends and included stock together in tighter relation under increased strains.

It will be quite obvious that other forms or readily disconnectible head and slot constructions may be substituted as shown in Fig. 8 for that herein specifically disclosed in Figs. 1 and 2 and indicated by 18, 13 and 14 therein, and that the bearing plate or washer 26 thereof may be utilized or omitted, if desired, and that the reentrant character indicated by 36 in Fig. 3 of the handle groove may be modified or omitted as in Figs. 9 and 10.

In Fig. 8 the band 31 with end 311 has beaded inturned edges 311*b*. The hole 313, however, is broadly diamond shape being elongated longitudinally of the end. The vertices are rounded as at 314 with the side faces flat as at 313*a*. Functionally, this slot is the same as that shown in Fig. 2.

It also will be understood that the pistol grip representation of the handle is purely conventional and any other desired type of handle having singular connection to the clamping band or like structure may be utilized as shown in Figs. 9 and 10.

Whenever it is not desired to mount the handle upon the band structure as secondarily described, hereinbefore, there may be provided, see Figs. 9 and 10, a hole 439 and 539 respectively of sufficient size in lieu of the slot 39 and in that event the handle is mounted on the clamping band or like structure only by passing the enlarged head 18 and the member 16 through this opening prior to passage through what has been broadly termed the bayonet slot type opening in the end 11.

Furthermore, it will be noted that the head 18 on its fluke portions has an end contacting face conforming in curvature to the curvature of said end. The purpose of this curvature is

that when the clamping finger piece 25 is positioned immediately adjacent the band for clamping association, it is substantially incapable of any other than the pivotal movement described.

The handle preferably is of heat insulating material. This may be of wood, composition, plastic or glass. In this connection it is to be observed that it is comparatively easy to drill and form by routing, and the like, the various slots, seats, grooves, et cetera, in the handle when it is of wood. When it is of molded plastic, et cetera, the material may be readily molded. However, when the material is of glass it is to be understood that the same may be drilled but is attended by great difficulty and considerable breakage. Accordingly, the slot that receives the member 16 when formed as a slot permits production of a handle of glass or one that requires no drilling.

When the invention is applied to glass containers, such as percolators, drip-o-lators, suction pots, et cetera, the following has been observed: As these devices are molded, the molds wear. Hence, the exterior perimeter of same vary increasingly until the molds wear out.

The present invention is of such stock that whereas the ends are properly positioned for standard ware, such would not be true for "oversize" ware. The metal while somewhat stiff and resilient, nevertheless will bend at the junction of the end and band upon initial application thereof to such an oversize container and handle and thus takes a proper permanent set slightly different from the original unparted set. Such set is thereafter retained. The foregoing accommodation is permitted because the force required to bend the stock for such set is less than that required to crush the container.

As a result each handled band is initially individualized to its particular container and rigidly holds and clamps same in the band regardless of accepted tolerance variation in containers.

Reference will now be had to Fig. 5. Therein primary numerals indicate like parts and similar numerals increased by one hundred indicate similar parts. This form of the invention is the reverse of that shown in Fig. 4 in that the band and handle are rigidly connected together when finger piece 125 lies adjacent the handle portion and are releasable or detachable when piece 125 lies adjacent band 10. Full lines illustrate the vessel clamping position of the several parts.

In Fig. 6 is illustrated a further embodiment of the basic invention. Herein numerals of the primary series indicate like parts and numerals of the two hundred series indicate equivalent parts. Each end is provided with a flat bearing area as at 211*a* and 212*a*. Herein a male screw 221 has its head 121*a* bearing on area 112*a*. A female socket screw 216 having head 218 bearing on area 211*a* has threaded connection at 217 with screw 221. These two areas are so embossed that parallel flat surfaces for contact are provided, yet portions 211 and 212 are inclined to seat in the handle formations.

The interconnected screws seat in notch 39 of handle 30 and serve to draw ends 211 and 212 into clamping engagement with the portion 30 of the handle when the ends are laterally applied thereto, see Method I aforesaid. These screws may be separated, or merely unthreaded the desired amount to longitudinally apply the handle to the band as previously described in Method II aforesaid. In both modifications, when desired, as previously described, the slot 39 may be used, but for Method I the slot 39 may be formed as a hole.

Preferably the interior or vessel contacting surface of the metal band is highly polished. If desired, it may be plated. The purpose thereof is to reflect from the band as much heat as possible and back into the vessel, if subjected to heat.

It will also be noted that the structures illustrated in each of Figs. 1 to 5, inclusive, each include another member. Glass to glass contact is of abrasive character. Glass molded articles primarily having a surface forming skin under high compression, the remainder being under tension, etc. In glass cooking ware, this relationship is extremely critical. Any material weakening of the skin may, upon slight shock or jar, result in complete shattering of the article that ordinarily would not normally shatter or crack under such a shock or jar. Prevention of scratching by the handle, if of glass, and more particularly the vessel if of glass, is most desirable.

The additional member referred to prevents such scratching and also provides a reenforcing or stiffening bearing member. It is illustrated in Fig. 7 and of a form to accommodate the handle 30 with its depending projection 34.

An elongated metal strap has an intermediate portion 50 arranged in tube formation providing a bore 51 therethrough. The two adjacent portions 52 abut each other and include oppositely directed lateral extensions 53 which terminate in parallel portions 54, each of which has a projection 55 laterally thereof and substantially parallel to portions 53. One and the upper end includes rearwardly directed tongue 56. The lower and other end includes the groove forming portion 57.

As shown in the several figures, this contact element is mounted on member 16—20, which projects through tubularity 51. Head 18 prevents separation. Portions 55 bear against the vessel while tongue 56 overlies the upper face of handle portion 33. Groove portion 57 underlies handle portion 34.

Thus handle-vessel contact is prevented and scratching is eliminated. Elimination thereof prevents glass vessel skin rupture with subsequent fracture, etc., as previously set forth, Preferably the glass or vessel contacting face of the member illustrated in Fig. 7 may be brightly polished and plated as well.

Although this member is not shown applied to the handle shown in Fig. 6, it is quite obvious it can be applied thereto. Note that portions 54, 53, 52 and 50 all seat or nest in the notch or slot in the vessel supporting end of the handle member 30.

The term "band" herein and in the claims is used in its broad sense, to-wit an element for encompassing an article such as a vessel and substantially conforming to the outline thereof so encompassed.

Fig. 9 is a perspective view of a modified form of handle having the hand clamp portion 430 in longitudinal alignment with the anchoring portion of the handle. Herein in lieu of the notch 39 there is provided a circular opening 439, and herein in lieu of the reentrant character of the side face recess of the anchoring portion of the handle the reentrant portion being indicated by 36 in Fig. 3, this is omitted and the recess may be of plain face or rectangular character.

Fig. 10 is a view similar to Fig. 9 but herein the handle portion 530 is shown of slight arch type as distinguished from a straight handle, see Fig. 9, or a pistol grip handle, see Figs. 1 and 3. In

this form of the invention the hole 539 is elliptical in cross-sectional outline as distinguished from the circular opening shown in Fig. 9. Such an opening accordingly requires a major axis but slightly larger than the overall length of the head 13 and a minor axis, but slightly greater than the width of the portion 21, see Fig. 2. From the aforesaid therefore it is clear that the broader features of the invention with open notch 39 is not a necessity either for the connection shown more particularly in Figs. 1, 4 and 5, or for the connection shown in Fig. 6, or equivalent connections well-known in this art. Also, for the broader features of the invention, the actual direction, an ornamental outline and configurations of the respective handle portions, designated by the numerals 30 and N30 wherein N is the appropriate digit in the hundred position, in the several handles illustrated, is variable at will or as desired.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. A handle clamping structure comprising a clamping band, the ends of said band extending outward as lugs spaced apart, a handle having a shank portion dimensioned to fit between said lugs, and clamping means engaging said lugs and operable to simultaneously tighten the band into clamping position and grip the handle shank between the lugs, said clamping means comprising a tension link engageable with one of said lugs and a cam pivoted to said link in position to bear against the other lug.

2. In the combination defined in claim 1, the handle shank having a notch open toward the band, dimensioned to accommodate the tension link when the shank is positioned between the lugs, and serving to permit entry or withdrawal of the shank without removal of the link from its normal operative position connecting said lugs.

3. In combination with a vessel, a handle structure comprising a band to fit around the vessel, the ends of said band extending outwardly as lugs spaced apart, a handle having a shank portion dimensioned to fit between said lugs, and clamping means engaging said lugs and operable to simultaneously tighten the band around the vessel and grip the handle shank between the lugs, and a cap member interposed between the end of the handle shank and the wall of the vessel, said cap having a flange portion lapping a surface of the shank exposed between the lugs.

4. In combination with a vessel, a handle structure comprising a band to fit around the vessel, the ends of said band extending outwardly as lugs spaced apart, a handle having a shank portion dimensioned to fit between said lugs, a clamping device including a tension link with means engaging said lugs and operable to simultaneously tighten the band around the vessel and grip the handle shank between the lugs, and a cap member interposed between the inner end of the handle shank and the wall of the vessel, said cap having a portion attached loosely to the tension link.

5. A readily separable handle clamp structure including a band having two free ends slightly spaced apart, an elongated member extending through one end and having a head portion detachably anchored upon the other end, a cam carried by the other end of said elongated member and bearable upon the other end of said band, and a handle having an anchoring portion with opposite faces including grooves therein for seating the band ends and an opening through said anchoring portion exposed at opposite ends by the grooves, said elongated member seating in the opening and being slidable longitudinally relative thereto for handle and band end rigid connection.

6. A structure as defined by claim 5, characterized by each face groove being deeper at its sides than at its midportion and each band end having its side edges correspondingly directed with reference to the midportion thereof for conformation to and wedge seating in the groove.

7. In the combination defined in claim 1, the handle shank portion having a notch open toward the band, dimensioned to accommodate the tension link when the shank is positioned between the lugs, and serving to permit entry or withdrawal of the shank portion without removal of the link from its normal operative position connecting the lugs together, the cap member attaching portion being accommodated in the notch of the shank and doubled to fit loosely around the tension link.

8. In the combination defined in claim 1, said tension link having a T-head of a thickness less than its width and the lug of the band operatively associated therewith having an elongated aperture through which said T-head may be withdrawn upon rotation of said link from its operative position whereby the ends of the band may be separated.

9. In the combination defined in claim 1, the side walls of the handle shank being recessed to accommodate said lugs, said lugs being curved in vertical cross section and concaved towards each other with their horizontal edges positioned to bear against the sides of the handle shank and engaging the upper and lower edges of the recesses in which said lugs are accommodated.

10. A handle clamping structure comprising a clamping member band, the ends of said band member extending outward as lugs spaced apart, a handle member having a shank portion dimensioned to fit between said lugs, and clamping means engaging said lugs and operable to simultaneously tighten the band member into clamping position and grip the handle member shank between the lugs, said clamping means comprising a link engageable with one of said lugs, a cam pivoted to said link in position to operatively bear against the other lug and an operating handle for the cam formed to extend close to one of the members when the cam is in clamping position and movable therefrom toward the other member when in non-clamping position.

11. A handle band clamping structure including a clamping band forming element with angular directed ends juxtapositioned to each other and with the free ends divergingly directed, and when mounted being slightly spaced and progressively inclined towards each other towards the free termination of said ends, a handle member having a hand engageable portion and an anchoring portion, the latter having two opposed bear-

ing faces slightly inclined to each other with the widest spacing therebetween toward the anchoring portion free end, and a communication between said faces through said anchoring portion, and adjustable means in the communication and having operative connection with the band ends for clamping the band ends to the included anchoring portion and in wedge locking association upon said inclined faces of the handle member anchoring portion, each band end relative to its adjacent bearing face having two spaced portions for initial contact therewith and the intermediate portion being out of the plane of contact of the spaced portions and associated with the said adjustable means for simultaneously clamping the band ends to the handle member and for securing the band in clamping position.

12. A structure as defined by claim 5, characterized by the handle anchoring portion opening consisting of an elongated slot for longitudinal presentation of said portion between the ends and mounting of the member in the opening.

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