

Description

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to hose clamping devices, and more specifically to a hose clamping device according to the generic part of claim 1.

Japanese Utility Model Application Laid-Open Publication No. 161780/1985 proposes a hose clamping device of the type as described above, in which a gate-shaped spring-up preventive member is provided on the base side of the web band to prevent the free end of the band from being sprung up.

In the conventional hose clamping device the gate-shaped band spring-up preventive member is provided with a bottom part 20 which connects two ribs which are oriented perpendicular to the plane of the band. Due to the existence of the bottom part and the orientation of the ribs perpendicular to the orientation of the band the resulting connecting assembly is very stiff and puts up a strong bending resistance when the winding diameter of the clamping ring is to be reduced.

In the conventional hose clamping device, an operating portion for rotating the worm screw adapted to move the web band is provided only on one side (right side) of a shaft. Therefore, when the worm screw is rotated rightward, clamping takes place, whereas when rotated leftward, loosening takes place. When the operating portion is located in a wide space, no problem occurs. However, the operation is compelled to be accomplished in a narrow place (space) in terms of execution. At that time, the operation has to be performed in a very tight attitude, since the operating portion is present only on one side. For a left-handed person, the rotating direction is reversed, so a problem is given rise to that the operation is difficult to perform.

Moreover, in the case where the operating portion is present only on one side, the mounting direction becomes decided. In the case where the device is set reversely, the band has to be removed and remounted, resulting in an inconvenience in operability.

SUMMARY OF THE INVENTION

The present invention has been accomplished in view of the problems as noted above with respect to the prior art. The hose clamping device according to the present invention is defined by claim 1. Preferred embodiments are claimed in dependent claims 2 and 3, and will be explained in greater detail also in the following with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal sectional front view of the device according to one embodiment of the present invention;

FIG. 2 is a longitudinal sectional side view of the same;

FIG. 3 is a front view of the same;

FIG. 4 is an exploded perspective view;

FIG. 5 is a front view showing a modified example of a spring-up preventive member;

FIG. 6 is an enlarged sectional view taken on line (6) - (6) of FIG. 5;

FIGS. 7 to 9 show another modified example of a housing;

FIG. 7 is a longitudinal sectional front view;

FIG. 8 is a sectional view taken on line (8) - (8) of FIG. 7; and

FIG. 9 is an exploded perspective view.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1 to 3 show an embodiment in which rotatably operating portions are provided on both sides of a worm screw. Reference numeral 1 designates a band, 2 a housing fixed to a base of the band 1, and 3 a worm screw encased in the housing 2 so that the worm screw can be rotated at a fixed position.

The band 1 is formed from a web-like stainless plate having a predetermined width. Engaging portions 4 are embossed at a predetermined pitch, the engaging portion 4 being inclined at a predetermined angle from the middle position lengthwise of the band to the fore end thereof. The housing 2 is fixed to the surface of the base not formed with the engaging portions 4.

The engaging portions 4 formed on the band 1 have an asymmetrical trapezoidal sectional shape so that the engaging portions 4 are stably and positively meshed with worms of the worm screw 3 which will be described later.

The housing 2 fixed to the base of the band 1 comprises a lower member 2a engaged with the back of the band 1 and an upper member 2b engaged with the lower member 2a. The lower member 2a is integrally formed with side walls 5 erected on both sides widthwise of the band 1. Engaging members 6 are bent directed upwardly on the both sides of the band 1 along the lengthwise thereof and mounted in mounting holes 7 bored in the band 1.

The upper member 2b is formed into an inverted U shape. An insert member 10 provided on the side wall 5 of the lower member 2a is inserted into an insert hole 9 bored in the side wall 8. The upper and lower members 2b and 2a are integrally

connected by being outwardly and horizontally bended.

Keep members 11 are vertically downwardly provided in openings on both sides of the upper member 2b along the lengthwise to hold at a fixed position the worm screw 3 encased in the housing 2.

In the worm screw 3 encased in the housing 2, a worm 3b is formed in the peripheral surface in the central portion of a shaft 3a, and rotatably operating portions 12 and 13 are formed on both side ends of the shaft 3a projected outwardly from the housing 2. Between the worm 3b in the shaft 3a and the operating portions 12 and 13 is formed a shoulder 14 with which is engaged the inverted U-shaped keep member 11 formed on the housing 2, whereby the worm screw 3 is prevented from its axial movement and is rotated at a fixed position.

The operating portions 12 and 13 have a regular hexagon in outer configuration and are formed in the side end thereof with a deep cross groove 15. One groove constituting the cross groove 15 is open to the peripheral surface. The worm screw 3 may be rotated even by the (-) type driver. It is noted that the operating portions 12 and 13 may be changed in size so as to discriminate the normal side for rightward rotation and the opposite side for leftward rotation.

On the side end of the upper member 2b in the housing 2, that is, on the side end from which the release end of the band 1 projects, is integrally provided a spring-up preventive member 16 having an approximately gate shape in front through a connecting member 17 continuous to the side wall 8. The direction in which the spring-up preventive member 16 is provided is projected along the peripheral direction about which the band 1 is wound.

While the spring-up preventive member 16 may be maintained in its disposed state only by the strength of the connecting member 17, it is noted that the free end of the spring-up preventive member 16 may be engaged to prevent a levitation of the member 16 in the diametral and outward direction and the movement thereof in the diametral and inward direction.

That is, as shown in FIG. 5, a recess 18 inflated in the diametral and outward direction is formed at a position extended lengthwise of the band 1 from a position in which the lower member 2a of the housing 2 in the band 1. The recess 18 has its depth which is approximately the same as a thickness of the spring-up preventive member 16 or larger than the thickness. The lower sides in the left and right side walls 16a on the free end of the spring-up preventive member 16 are inwardly bended, wound and engaged with the recess 18.

FIGS. 7 to 9 show the construction wherein a housing is composed of a single member. Both side members 19a and 19b of a housing 19 formed into a tunnel-like curve are downwardly wound. Front and rear sides in the central portion widthwise in the lower surfaces of the left and right winding members 19a and 19b are inflated to form an engaging recess 22 into which is engageably fitted engaging pawls 21 formed in a band 20.

A portion of the band 20 to which the housing is fixed is upwardly bent to form a recess 23 so as to receive therein the winding members 19a and 19b of the housing 19. The upper surface wall of the recess 23 is formed with a notch 24 in which is fitted a projecting portion which forms a recess 22 inflated from the winding members 19a and 19b. The engaging pawl 21 fitted in and engaged with the recess from the front and rear side edge of the recess is formed by cutting the notch 24.

Accordingly, the left and right winding members 19a and 19b of the housing are wound and fitted into the recess 23 of the band 20, the projecting portions of the winding members are fitted into the notch 24, and the engaging pawl 21 is fitted in the recess 22 and then caulked. Thereby, the housing 19 can be fixed in position to the band 20, and the curved inner surface of the band 20 has the same face as the lower surface of the winding members 19a and 19b of the housing 19. Therefore, a danger of giving a damage to the hose fitted internally of the wound band 20 is positively overcome.

In the hose clamping device constructed as described above, by rotation of the worm screw 3, the band 1 with which the engaging portions 4 are meshed is gradually wound to reduce the winding diameter formed by the band 1. Thus the hose fitted in and connected to the nipple can be clamped.

The rotation of the worm screw 3 adapted to move the band 1 can be operated on either side of the worm screw 3.

The free end of the band 1 jumped out from the side end of the housing 2 with the reduction in winding diameter is guided and inserted into the spring-up preventive member 16 provided on the housing 2 to prevent the free end of the band 1 from being sprung up.

As described in detail, according to the hose clamping device of the present invention, the rotatably operating portions are provided on both sides of the shaft of the worm screw, whereby the rotating operation of the worm screw for moving the band meshed with the worm screw can be performed on either side of the worm screw.

Accordingly, in the case where the mounting place is so narrow that the operation on the normal

side (rightward rotation) is difficult to perform, the operation of leftward rotation can be performed by the operating portion on the opposite side. In addition, since the operating portion opposite the normal side is leftward rotation, a left-handed person can easily perform the operation with his left hand. Since the operating portions are provided on both sides of the worm screw, the mounting direction of the clamping device has a flexibility, thus eliminating the necessity of remounting as experienced in prior art.

Furthermore, the band spring-up preventive member is provided toward the jumping direction of the band release end side in the housing enclosing therein the worm screw. Therefore, the spring-up of the free end of the band resulting from the reduction in the winding diameter of the band is suppressed by the aforesaid spring-up preventive member, as a result of which the band is drawn out the winding direction thereof. Accordingly, there involves no danger of catching fingers or clothes in the band without cutting the projecting end of the band. Thus, the device can be safely used.

Moreover, in the case where the release end of the spring-up preventive member is engaged with the band, the spring-up preventive member is prevented from being levitated diametrically and outwardly to fully secure the function as the spring-up preventive member. The preventive member is not moved diametrically and inwardly even if the external force acts thereon. Accordingly, there involves no danger that the lower end of the side wall of the spring-up preventive member is forced into the hose to damage the latter. Thus, the device can be used safely.

Claims

A hose clamping device comprising: a band (1) having a free end and a base near the opposite end and having a plurality of engaging portions (4) embossed with a predetermined pitch along the lengthwise direction thereof; a housing (2) fixedly mounted on the base of the band (1) and having an outlet port for the free end of the band; a worm screw (3) encased stationary in the housing (2) and being adapted for engaging the engaging portions (4) of the band; a gate-shaped spring-up preventive member (16) for preventing a spring-up action of the free end of the band being provided on the side of said outlet port of said housing through a pair of strip-shaped connecting members (17) extending from said outlet port along the side edges of the band; characterized in that the connecting members are continuous to said housing, project from said outlet port of said housing separately with no

mutual connection therebetween and are oriented with their main surfaces parallel rather than perpendicular to those of the band.

2. The device of claim 1, wherein both free ends of said spring-up preventive member (16) are bent inwardly against each other and engage within a recess (18) formed in the band (1).
3. The device as claimed in claim 1 or 2, wherein the worm screw has operating portions provided at both its shaft ends, wherein the operating portions are provided with a cross groove to fit a plus driver, wherein a groove is cut over the sectional face of the operation portions to fit a minus driver and wherein the operation portions are circumferentially hexagonally shaped to be operated by a spanner.

Patentansprüche

1. Schlauch-Klemmvorrichtung, die folgendes umfaßt: ein Band (1) mit einem freien Ende und einer Basis in der Nähe des entgegengesetzten Endes sowie einer Vielzahl von Eingriffsabschnitten (4), die mit einer vorbestimmten Steigung in Längsrichtung in das Band getieft sind, ein Gehäuse (2), das fest an der Basis des Bandes (1) angebracht ist und eine Auslaßöffnung für das freie Ende des Bandes aufweist, eine Schneckengewindeschraube (3), die feststehend im Gehäuse (2) angeordnet und dazu geeignet ist, die Eingriffsabschnitte (4) des Bandes in Eingriff zu nehmen und einen torförmigen Niederhalter (16), der ein Hochspringen des freien Bandendes verhindert und auf der Auslaßöffnungsseite jenes Gehäuses durch ein Paar streifenförmiger Verbindungselemente (17) vorgesehen ist, die sich von jener Auslaßöffnung an den Seitenkanten des Bandes entlang erstrecken, dadurch gekennzeichnet, daß die Verbindungselemente eine Fortsetzung jenes Gehäuses bilden, einzeln von jener Auslaßöffnung jenes Gehäuses vorstehen, ohne miteinander verbunden zu sein, und mit ihren Hauptflächen nicht senkrecht, sondern parallel zu denen des Bandes ausgerichtet sind.
2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß beide freien Enden jenes Niederhalters (16) nach innen aufeinander zu gebogen sind und in eine im Band (1) gebildete Ausnehmung (18) eingreifen.
3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Schneckengewindeschraube an ihren beiden Schaftenden Betriebs-

side (rightward rotation) is difficult to perform, the operation of leftward rotation can be performed by the operating portion on the opposite side. In addition, since the operating portion opposite the normal side is leftward rotation, a left-handed person can easily perform the operation with his left hand. Since the operating portions are provided on both sides of the worm screw, the mounting direction of the clamping device has a flexibility, thus eliminating the necessity of remounting as experienced in prior art.

Furthermore, the band spring-up preventive member is provided toward the jumping direction of the band release end side in the housing enclosing therein the worm screw. Therefore, the spring-up of the free end of the band resulting from the reduction in the winding diameter of the band is suppressed by the aforesaid spring-up preventive member, as a result of which the band is drawn out the winding direction thereof. Accordingly, there involves no danger of catching fingers or clothes in the band without cutting the projecting end of the band. Thus, the device can be safely used.

Moreover, in the case where the release end of the spring-up preventive member is engaged with the band, the spring-up preventive member is prevented from being leviated diametrally and outwardly to fully secure the function as the spring-up preventive member. The preventive member is not moved diametrally and inwardly even if the external force acts thereon. Accordingly, there involves no danger that the lower end of the side wall of the spring-up preventive member is forced into the hose to damage the latter. Thus, the device can be used safely.

Claims

A hose clamping device comprising: a band (1) having a free end and a base near the opposite end and having a plurality of engaging portions (4) embossed with a predetermined pitch along the lengthwise direction thereof; a housing (2) fixedly mounted on the base of the band (1) and having an outlet port for the free end of the band; a worm screw (3) encased stationary in the housing (2) and being adapted for engaging the engaging portions (4) of the band; a gate-shaped spring-up preventive member (16) for preventing a spring-up action of the free end of the band being provided on the side of said outlet port of said housing through a pair of strip-shaped connecting members (17) extending from said outlet port along the side edges of the band; characterized in that the connecting members are continuous to said housing, project from said outlet port of said housing separately with no

mutual connection therebetween and are oriented with their main surfaces parallel rather than perpendicular to those of the band.

2. The device of claim 1, wherein both free ends of said spring-up preventive member (16) are bent inwardly against each other and engage within a recess (18) formed in the band (1).
3. The device as claimed in claim 1 or 2, wherein the worm screw has operating portions provided at both its shaft ends, wherein the operating portions are provided with a cross groove to fit a plus driver, wherein a groove is cut over the sectional face of the operation portions to fit a minus driver and wherein the operation portions are circumferentially hexagonally shaped to be operated by a spanner.

Patentansprüche

1. Schlauch-Klemmvorrichtung, die folgendes umfaßt: ein Band (1) mit einem freien Ende und einer Basis in der Nähe des entgegengesetzten Endes sowie einer Vielzahl von Eingriffsabschnitten (4), die mit einer vorbestimmten Steigung in Längsrichtung in das Band getieft sind, ein Gehäuse (2), das fest an der Basis des Bandes (1) angebracht ist und eine Auslaßöffnung für das freie Ende des Bandes aufweist, eine Schneckengewindeschraube (3), die feststehend im Gehäuse (2) angeordnet und dazu geeignet ist, die Eingriffsabschnitte (4) des Bandes in Eingriff zu nehmen und einen torförmigen Niederhalter (16), der ein Hochspringen des freien Bandendes verhindert und auf der Auslaßöffnungsseite jenes Gehäuses durch ein Paar streifenförmiger Verbindungselemente (17) vorgesehen ist, die sich von jener Auslaßöffnung an den Seitenkanten des Bandes entlang erstrecken, dadurch gekennzeichnet, daß die Verbindungselemente eine Fortsetzung jenes Gehäuses bilden, einzeln von jener Auslaßöffnung jenes Gehäuses vorstehen, ohne miteinander verbunden zu sein, und mit ihren Hauptflächen nicht senkrecht, sondern parallel zu denen des Bandes ausgerichtet sind.
2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß beide freien Enden jenes Niederhalters (16) nach innen aufeinander zu gebogen sind und in eine im Band (1) gebildete Ausnehmung (18) eingreifen.
3. Vorrichtung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Schneckengewindeschraube an ihren beiden Schaftenden Betriebs-



abschnitte aufweist, daß die Betriebsabschnitte mit einem Kreuzschlitz versehen sind, in den ein Schraubendreher für Kreuzschlitzschrauben paßt, daß über die Schnittfläche der Betriebsabschnitte ein Schlitz eingeschnitten ist, in den ein Schraubendreher für Schlitzschrauben paßt und daß der Umfang der Betriebsabschnitte hexagonal gestaltet ist, so daß ein Schraubenschlüssel eingesetzt werden kann.

5

10

Revendications

1. Dispositif de serrage pour tuyau flexible comportant: un collier (1) ayant une extrémité libre et une base près de l'extrémité opposée et ayant une pluralité de portions d'engrènement (4) embouties selon un pas prédéterminé le long de la direction longitudinale de celui-ci; un logement (2) monté fixe sur la base du collier (1) et ayant un orifice de sortie de l'extrémité libre du collier; une vis sans fin (3) encastrée et immobile dans le logement (2) et prévue pour s'engrener dans les portions d'engrènement (4) du collier; un élément anti-rebiquement (16) en forme de pont pour empêcher que l'extrémité libre du collier ne rebique, étant prévu du côté dudit orifice de sortie dudit logement par l'intermédiaire d'une paire d'éléments de connexion (17) en forme de barrettes s'étendant depuis ledit orifice de sortie le long des bords latéraux du collier; caractérisé en ce que les éléments de connexion sont dans la continuation dudit logement, font saillie depuis ledit orifice de sortie dudit logement séparément et sans connexion mutuelle entre eux, et sont orientés avec leurs surfaces principales parallèles plutôt que perpendiculaires à celles du collier.
2. Dispositif selon la revendication 1, dans lequel les deux extrémités libres dudit élément anti-rebiquement (16) sont coudées vers l'intérieur l'une vers l'autre et s'engrènent dans un évidement (18) formé dans le collier (1).
3. Dispositif selon la revendication 1 ou 2, dans lequel la vis sans fin a des portions fonctionnelles prévues aux deux extrémités de sa tige, dans laquelle les portions fonctionnelles sont prévues avec une rainure cruciforme pour pouvoir recevoir un tournevis cruciforme, dans laquelle une rainure est creusée dans la face transversale des portions fonctionnelles pour pouvoir recevoir un tournevis pour vis à tête fendue, et dans laquelle les portions fonctionnelles ont une forme hexagonale circonférentielle pour pouvoir être actionnées par une clé à vis.

15

20

25

30

35

40

45

50

55



* C L M S *

5