

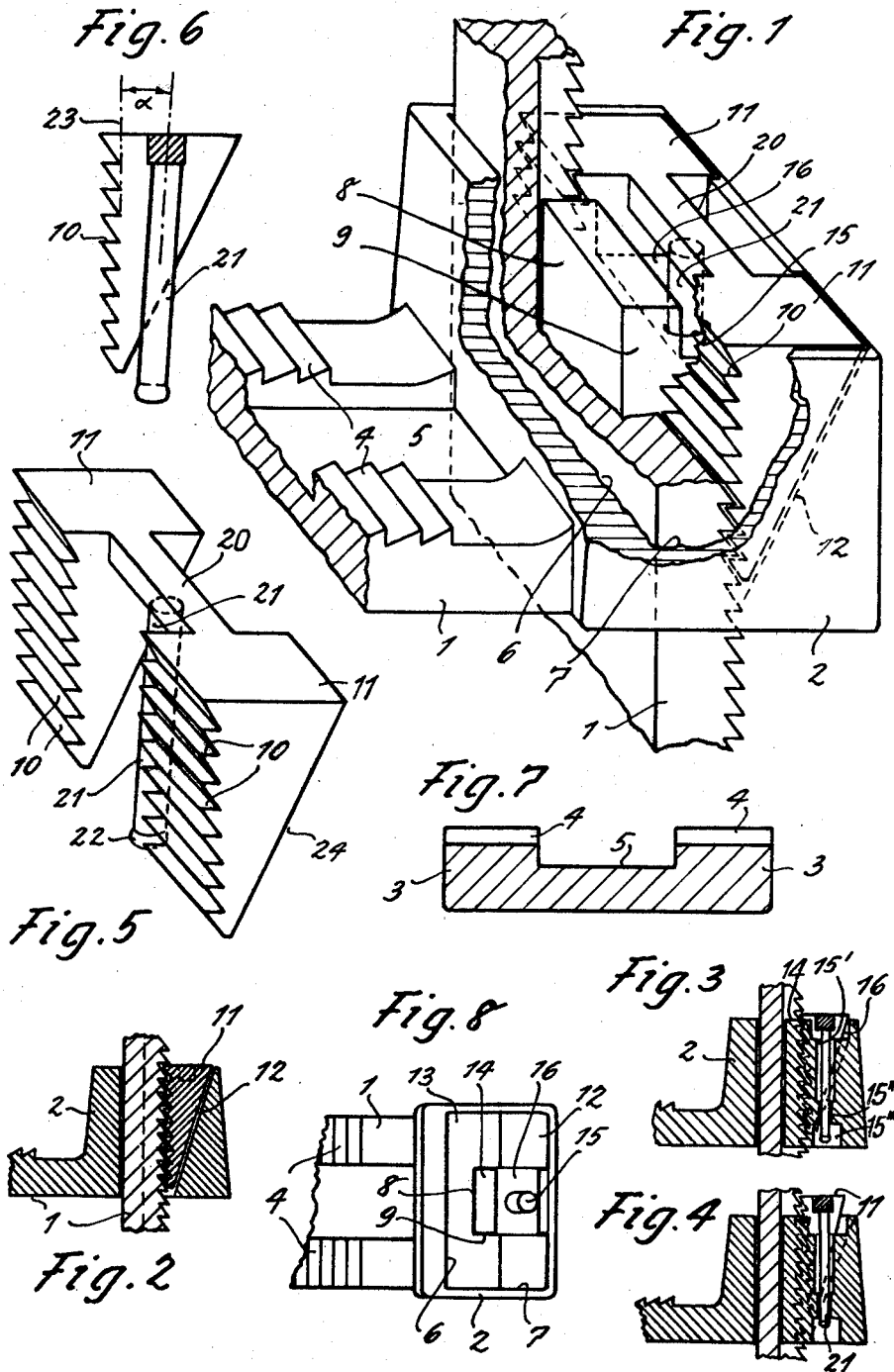
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H. KABEL

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CABLE CLAMPS

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CABLE CLAMPS

Heinrich Kabel, Quickborn, Germany, assignor to Paul Hellermann G.m.b.H., Pinneberg, Germany

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5 Claims

ABSTRACT OF THE DISCLOSURE

A cable clamp comprising a strap having at one end a lock member into which the other end of the strap can be inserted. To restrain the inserted end from removal one face of the strap is provided with teeth which are engaged by corresponding teeth on a wedge which co-operates with an oblique surface inside the lock member to grip the inserted strap. The wedge is attached to the lock member by means of elastically flexible means which urge the disengaged wedge away from the oblique surface in the lock member.

This invention relates to a cable clamp with a strap, which is solidly connected at one end to a lock member arranged to accommodate and secure the other end of the strap, one side of the strap being provided with teeth, which in the lock member interact with corresponding teeth of a gripping wedge, which is situated between a guide channel provided for the strap and an oblique surface of the lock member. (U.S.A. patent specifications 3,149,808, 3,197,829, 3,098,271.) The known cable clamps of this kind have the disadvantage that the wedges can completely leave the path of the strap in their disengaged position, which path is previously described by the guiding of the strap in the lock member, and that in this position they do not securely grip the strap inserted, gripped and then released in the lock member, so that they must be pushed along by hand.

The invention has for its object to provide a cable clamp of the type mentioned above, and which does not have this disadvantage.

The solution consists in that the wedge and the lock member are provided with interacting elastically flexible guides, which urge the wedge in its disengaged position away from the oblique surface of the lock member into the strap guide channel.

The guides ensure that the wedge remains in contact with the strap even in the disengaged position and firmly engages with it. On the other hand they do not prevent the regular interaction of the corresponding oblique surfaces of the wedge and the lock member, although they cannot harmonise their guiding action with the direction of these oblique surfaces, as they can flex elastically, if the oblique surfaces assigned to each other at the wedge and in the lock member are pressed together by the gripping forces.

Advantageously the wedge is formed by two wedge components having a gap between them and arranged together on the same side of the strap guide channel, the guides interacting at the wedge and lock member being arranged between the wedge components. This arrangement has the advantage that the guides are accommodated in a zone of the lock member which is poorly suited for transmitting gripping forces, because the gripping forces would cause relatively high bending forces in the centre of the lock member, while the lateral arrangement in pairs of the teeth in the lock member produces only comparatively small bending forces.

In a particular embodiment of the invention, the wedge components are connected by a yoke carrying a guide pin, which is accommodated by a guide bore of the lock member; the guide pin forms a smaller angle with the oblique surface of the wedge components than the guide bore does with the oblique surface of the lock member, the guide pin and the guide bore being so arranged that the wedge components are forcibly held in place in the disengaged position, in which the wedge teeth in the wide wedge zone project into the zone of the strap teeth, while the wedge teeth are retracted from it in the narrow wedge zone. In the disengaged state therefore the wedge components assume a rotated position in respect of the direction of the oblique surfaces in the lock member. The advantage of this arrangement consists in that the insertion of the strap in the lock member from the released wedge, which projects into strap guide zone, is not hindered.

According to the lateral arrangement of the toothed wedge in the lock member, the strap teeth are also advantageously provided only at the edge portions of one strap side, while the centre of the strap is recessed and in this way makes room for a projection between the oblique surfaces in the lock member, in which the guiding for the wedge is provided for.

A specific embodiment of the invention will now be described by way of example, with reference to the accompanying drawing, in which:

FIGURE 1 shows a partly cut away general view in perspective of the lock member with the strap component inserted,

FIGURE 2 shows a longitudinal section through the lock member showing a wedge,

FIGURE 3 shows a central longitudinal section through the lock member with the wedges drawn into the gripped position,

FIGURE 4 shows a central longitudinal section through the lock member with the wedges drawn out into the disengaged position,

FIGURE 5 shows a representation in perspective of the pair of wedge components,

FIGURE 6 shows a section through the pair of wedge components,

FIGURE 7 shows a cross section of the strap, and

FIGURE 8 shows a plan view of the lock member with wedge components.

A strap 1, of which only the end fastened to a lock member 2 and a portion of the strap drawn through the lock member can be seen in FIGURE 1, is sufficiently long to encircle the object to be clamped, for example, a bunch of cables. It is made in one piece with the lock body from sufficiently strong and flexible material, for example, from nylon. It has a cross section, which can be seen in FIGURE 7, with thickened side parts 3, which carry teeth 4 and enclose a thinner portion 5.

The lock body is of substantially parallelepiped form. It defines an internal guide channel for the strap corresponding in cross section to the cross sectional form of the strap, this guide channel being symmetrically bounded by surfaces 6, 7, 8, 9 and teeth 10 of wedge components 11. The wedge components each have one side adjacent to an oblique surface 12 formed by the lock member. Between the oblique surfaces 12 a projection 14 projects into the strap guide channel 13, which projection forms the guide surfaces 8 and 9 and includes a bore 15 directed parallel to the guiding direction of the strap, which bore is made wider in its upper zone 15' (FIGURE 3) than in its lower zone 15'' and opens out into a recess 15''' on the underside of the lock member. The attachment 14 is recessed in its rear part 16 in which the bore 15 is situated. The bore extends substantially parallel to the

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guiding direction of the strap 1 in the strap guide channel 13. The pair of gripping wedges 11 is connected by a thin yoke 20, which carries a likewise thin guide pin 21, which is enlarged at its lower end 22. The teeth 23 of the wedges 11 mesh with the teeth 4 of the strap 1. The rear oblique surface 24 of the wedges forms the same angle with the tooth plane 23 as the oblique surface 12 in the lock member does with the guide direction of the strap. The guide pin 21 forms a very small angle α , for example 5° , with the line of the tooth plane 23. The guide pin 21 in the assembled position is accommodated by the bore 15 of the lock member, as can be seen in FIGURES 1 and 3. The arrangement of the guide pin 21 and the bore 15 is such that the wedge components in the disengaged position (FIGURE 4) project in the upper zone into the teeth 4 of the strap, while the wedge in the lower part is retracted to the oblique surfaces 12 of the lock member. The pin 21 and the yoke 20 however are so flexible, that they do not offer any substantial opposition to the movement of the wedge components 11 into the gripping position (FIGURE 3). This construction has the advantages that the strap can easily be inserted, and that the teeth of the gripping wedge are in constant contact with the strap teeth and on releasing the strap immediately grip.

In the assembled position, the enlarged end 22 of the guide pin 21 is situated in the recess 15''' (FIGURE 3) and prevents unintentional removal of the wedge components from the lock member. The enlargement is not substantially larger than the diameter of the bore 15'', so that it can be forced through under elastic deformation.

The operation of the parts described is as follows:

The strap looped round the object to be clamped is inserted by the end shown at the bottom in FIGURE 1 into the lock member 2 and gripped. When sufficient grip is obtained, the strap is released. It retracts a little, the wedge components 11 then being pulled with it on account of the engagement of their teeth with strap teeth 4 until they reach the gripping position (FIGURE 2), in which the strap is securely locked.

I claim:

1. A cable clamp comprising a strap, which is solidly connected at one end to a lock member arranged to accommodate and secure the other end of the strap, the

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strap being provided on one of its sides with teeth which interact in the lock member with corresponding teeth of a gripping wedge, which is situated between a guide channel provided for the strap and an oblique surface of the lock member, wherein the wedge and the lock member are provided with interacting, elastically flexible guides, which urge the wedge in its disengaged position away from the oblique surface of the lock member into the strap guide channel.

2. A cable clamp as claimed in claim 1, wherein the wedge is formed by two wedge components having a gap between them and arranged together on the same side of the strap guide channel, the guides interacting at the wedge and lock member being arranged between the wedge components.

3. A cable clamp as claimed in claim 2, wherein the wedge components are connected together by a yoke, to which is fastened a guide pin, accommodated in a guide bore of the lock member, the guide pin forming a greater angle with the strap guide direction than the guide bore does with strap guide direction, the guide pin and the guide bore being so arranged, that the wedge components are forcibly held in place in the disengaged position, in which the wedge teeth in the wide wedge zone project into the zone of the strap teeth, while in the narrow wedge zone the wedge teeth are retracted from it.

4. A cable clamp as claimed in claim 3 wherein the strap teeth are provided at each edge portion of one strap side, while the strap centre is recessed and makes room for a projection between the oblique surfaces in the lock member, in which the guiding for the wedge is provided for.

5. A cable clamp as claimed in claim 3 wherein the guide pin is longer than the guide bore and at the end is so enlarged in relation to the diameter of the bore that this enlargement can fit the bore only with elastic deformation.

References Cited

UNITED STATES PATENTS

3,127,648	4/1964	Emery.
3,300,825	1/1967	Andreasen.

DONALD A. GRIFFIN, Primary Examiner