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Clamping device

10 The invention relates to a clamping device, in particular a cable clamping device for communications technology and data systems technology in accordance with the preamble of Patent Claim 1.

15 Known clamping devices such as pipe clips or cable clamps permit the clamping of pipes, hoses or cables only for a small range of diameters in each case. Only narrow diameter ranges can be dealt with by one clamping device. The clamped objects are not protected against being crushed; the extent of pinching
20 is determined by the operative and is not limited by the clamping device.

 DE 43 34 615 C1 describes an electric plug-in connector to which a shield contact can be clamped in order to provide continuous shielding of the cable up
25 to the plug-in connector. The cable shield is connected in this case in a conducting fashion to the shield contact via a crimped connection. The crimped connection is undertaken by means of a crimping ring or a cable tie. It is possible to achieve only inadequate
30 adaptation to different cable diameters by this means, as well.

 It is the object of the invention to develop a clamping device of the generic type which ensures that objects having different diameters are clamped simply
35 and reliably and without the risk of an impermissibly high degree of pinching of the object.

 The way this object is achieved follows from the characterizing features of Claim 1. In conjunction with the sleeve constructed in accordance with the
40 invention, the clamping body constructed in accordance



with the invention ensures the stress relief and/or the full-area (360°) extension of the shielding of cables with different diameters or, in general, the clamping of objects of different diameters by means of a single
5 clamping device.

The dimensioning of the clamping arms in accordance with the intended application has the effect of exerting on the object or on a cable a defined force which cannot be exceeded, with the result that there is
10 no risk of an impermissibly high degree of pinching of the object.

Changes in diameter of the clamping member of the clamping device are possible by a simple rotation of the sleeve over a wide range.

15 The clamping device accomplishes a detachable connection and can be reused.

Further advantageous refinements of the invention follow from the subclaims.

The invention is explained in more detail below
20 with the aid of exemplary embodiments, represented in the drawings, of a clamping device for cables. In the drawings:

- Figure 1 shows an exploded representation of the clamping device with a round design of the clamping member,
25 Figure 2 shows a perspective representation of a clamping body of square construction,
Figure 3 shows the perspective representation of the sleeve,
30 Figure 4 shows a sectional representation of the clamping device with a square clamping member pushed into the sleeve,
Figure 5 shows the sectional representation of the clamping device according to Figure 4,
35 4, with slightly tensioned clamping arms, and
Figure 6 shows a sectional representation of the clamping device according to Figure 4

with highly tensioned clamping arms for thin cable wires.

In addition to its general use, the clamping device can advantageously be used, in particular, for application in telecommunications technology and data systems technology as a cable clamping device for shield cables. In conjunction with RJ 45 bushes, for example, the clamping device according to the invention ensures reliable stress relief and a full-area 360° extension of the cable shield to the bush.

Represented in Figure 1 is a cable clamping device which essentially comprises a round clamping member 1, formed from a basic body 6 with clamping arms 5, and a sleeve 2 with cutouts 4 which are wedge-shaped from inside to outside.

The clamping device can be connected to an RJ 45 bush (not represented) via a connection plate 9 which is connected to the clamping member 1 and to its holding and reinforcing sleeve 10.

The cable shield is connected in an electrically conducting fashion to the electrically conducting clamping member 1, and the latter is connected to the shield, for example of the RJ 45 bush, via the connection plate 9, with the result that closed shielding from the cable to the bush is ensured.

The holding and reinforcing sleeve 10 is plugged through the connection plate 9 from above such that two tongues 12 of the holding and reinforcing sleeve 10 latch into two cutouts 13 of the connection plate 9 and are thereby secured against rotation. The holding and reinforcing sleeve 10 with the connection plate 9 fastened thereto is inserted into the clamping member 1 and connected to the latter by lugs 14 which are bent over outwards, with the result that the connection plate 9 is firmly anchored on the clamping member 1. The assembly thus formed from the holding and reinforcing sleeve 10, the connection plate 9 and the clamping member 1 is pushed into the sleeve 2. The

clamping member 1 is thereby fixed with respect to the sleeve 2.

5 A cable (not represented in Figure 1) is pushed with the shield into the clamping member 1 and clamped there, by rotating the sleeve 2 in the direction of the arrow 15 in an anticlockwise direction, via the clamping arms 5 of the clamping member 1, which engage in the cutouts 4 in the sleeve 2. The basic body 6 of the clamping member 1 is fixed with respect to the sleeve 2, as described above, and its position is not changed by the rotation of the sleeve 2, that is to say the basic body 6 is not rotated. The change in diameter, and thus the clamping effect on the cable, result from the reduction in diameter between the clamping arms 5 (Figures 4 to 9). Changes in diameter of, for example, 10 mm to 3 mm can be performed using a single embodiment.

20 The clamping member 1 is shown in a square embodiment in Figure 2. The basic body 6 is formed from movable arms 11 which are connected to one another (in a unipartite fashion or else, for example, by hinges such as film hinges). Four clamping arms 5, for example, are formed from the basic body 6 in four different planes, for example by punchings.

25 Bent out of one of the arms 11 is a ratchet 7 which, after the insertion of the clamping member 1 into the sleeve 2 according to Figure 3, engages in inner teeth 8 of the sleeve 2, and when the sleeve is rotated, effects additional locking of the clamping member 1 in a desired position in the sleeve 2.

30 Figure 3 also shows four wedge-shaped cutouts 4 in which the four clamping arms 5 of the clamping member 1 (Figure 2) engage.

35 The clamping device is shown in the assembled state in Figure 4. The clamping member 1 is inserted into the sleeve 2, and the clamping arms 5 are located essentially free from stress in the cutouts 4.



A flat 16 which can be seen on the upper rim of the sleeve 2 (Figures 3 to 6) serves to orientate the position of the sleeve 2.

Figure 5 shows the clamping device with an
5 inserted cable 3 of the maximum possible diameter. The sleeve 2 is rotated as far as permitted by the cable diameter, in order to tension or clamp the cable 3. As a result, the clamping arms 5 of the clamping member 1 are tensioned and exert a corresponding pressure on the
10 lateral surfaces of the cutouts 4 in the sleeve 2.

The clamping device is shown in Figure 6 with an inserted cable 3 which has a small diameter. In order to tension the cable 3, the sleeve 2 is rotated so far that the clamping arms 5 of the clamping member
15 1 still just hold in the cutouts 4 of the sleeve 2. The basic body 6, serving as a frame, of the clamping member 1 remains clearly unchanged, while the clamping arms 5 are pushed together by the rotation of the sleeve 2 and effect the clamping of the cable 3. The
20 point of connection between the respective clamping arms 5 and the basic body 6 in this case forms the respective fulcrum for the clamping arms 5 to be rotated together in the anticlockwise sense in the direction of the arrow 15 to form a new clamping
25 diameter D.

The clamping device can be produced from a suitable plastic, the clamping member 1 being metallized or produced from an electrically conducting material if the clamping device is provided as a cable
30 clamping device for the purpose also of extending the cable shield.

The sleeve 2 can be provided on the outside with gripping hollows.

LIST OF REFERENCE SYMBOLS

- 1 Clamping member
- 2 Sleeve
- 3 Object (cable)
- 4 Cutout
- 5 Clamping arm
- 6 Basic body
- 7 Ratchet
- 8 Teeth
- 9 Connection plate
- 10 Holding and reinforcing sleeve
- 11 Movable arm
- 12 Tongue
- 13 Cutout
- 14 Lug
- 15 Direction of arrow
- 16 Flat

D Diameter



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Patent Claims

1. Clamping device, in particular a cable clamping device for communications technology and data systems technology, characterized in that a clamping member (1), which is formed from a basic body (6) and at least one clamping arm (5) and into which the object (3) to be clamped is inserted, is pushed into a sleeve (2) having cutouts (4) in which at least one of the clamping arms (5) of the clamping member (1) engages, and in that by rotating the sleeve (2) with respect to the fixed basic body (6) at least one of the clamping arms (5) reduces the clamping inside diameter (D) of the clamping member (1).

2. Clamping device according to Claim 1, characterized in that the clamping arms (5) are led out of the clamping member (1) in different planes.

3. Clamping device according to Claims 1 and 2, characterized in that the clamping member (1) is a unipartite punched part with punched clamping arms (5).

4. Clamping device according to Claims 1 to 3, characterized in that the clamping member (1) forms an electrically conducting shield contact.

5. Clamping device according to Claim 1, characterized in that the clamping member (1) has a ratchet (7) which engages in inner teeth (8) of the sleeve (2).

6. Clamping device according to Claim 1, characterized in that a holding and reinforcing sleeve (10) is inserted into the basic body (6) of the clamping member (1).

7. Clamping device according to Claim 1, characterized in that the basic body (6) of the clamping member (1) is of a round or polygonal shape.

