

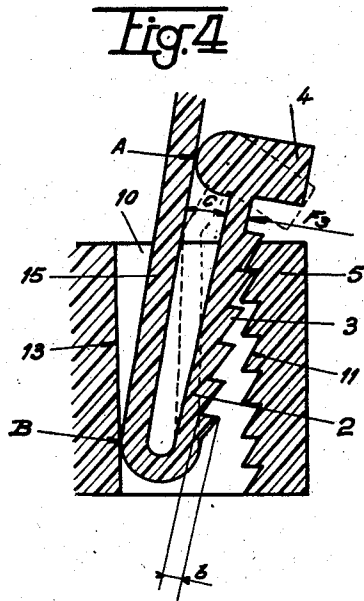
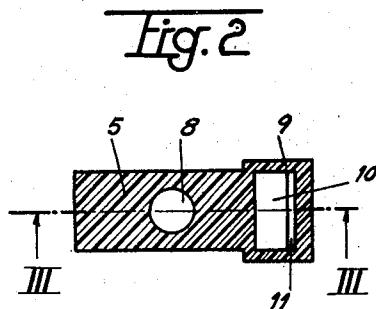
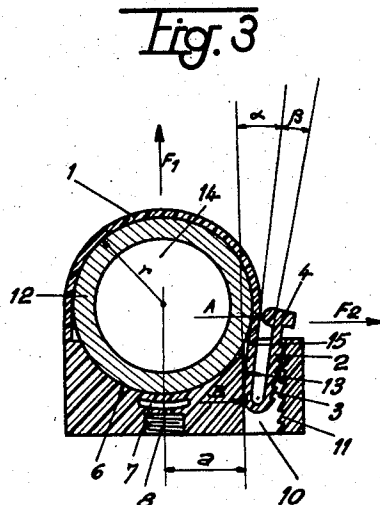
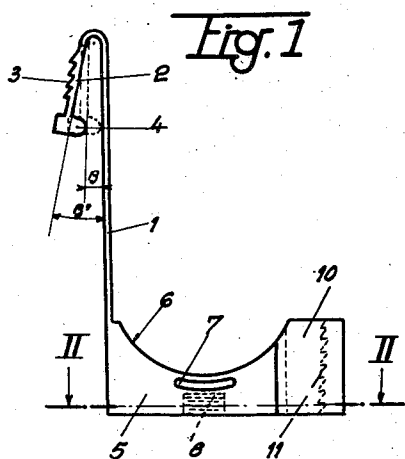
April 28, 1959

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2,884,214

RING CLIPS AND CLAMPS PRODUCED BY MOULDING

Filed April 6, 1956



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RING CLIPS AND CLAMPS PRODUCED BY MOULDING

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Application April 6, 1956, Serial No. 576,647

Claims priority, application France May 17, 1955

5 Claims. (Cl. 248—74)

This invention relates to a new or improved ring clip or clamp and to a process for making the same and has for its object to provide a clip or clamp which is economically produced by a moulding operation and which, nevertheless, is adapted for giving great security while affording quickness and sureness in the operations of clamping and unclamping involved.

According to the present invention a ring clip or clamp moulded as a single piece from synthetic plastic material comprises a base part of substantially parallelepiped form provided with a hole or recess for fixing it to a supporting surface and with an elongated recess at one end, the internal wall of such recess nearer that end having a toothed formation, and a thin, narrow blade or band extending integrally from the opposite end of said base and having a toothed formation at its free end, this blade or band being adapted for being bent over and around an object seated upon said base and for having its free end inserted into the elongated recess whereupon the elasticity of such blade or band effects an interengagement of the toothed formations so that a secure clipping or clamping of the said object is obtained.

To enable the invention to be readily understood, reference is made to the accompanying drawing which illustrates, by way of example, one construction of ring clip or clamp according to the invention, in which drawing:

Figure 1 is a side elevation of the ring clip or clamp after it has been moulded and before use;

Figure 2 is a horizontal plan section on the line II—II in Figure 1;

Figure 3 is a cross section on the line III—III of Figure 2, and shows the device of Figure 1 as applied for the clipping or clamping of a tube;

Figure 4 is a section to a larger scale of parts seen at the right hand side of Figure 3.

Referring to Figures 1 to 3, the clip or clamp, which is moulded in one piece from synthetic plastic material, comprises a long blade or band 1 of suitable narrow width and thinness, the extremity 2 of which is folded back outwardly upon the part 1 and, because of the resiliency of the material, has a tendency to separate itself elastically from the part 1. The folded back part 2 may be formed in the moulding of the device, or may be formed under suitable treatment after such moulding. The said part 2 comprises on its outer face a series of ratchet tooth formations 3 and terminates in an enlargement or knob 4 which forms a T-head and is cylindrically rounded on that side which is presented towards the blade part 1, as illustrated. The knob 4 is disposed at a short distance from the last tooth of the said series 3. The blade 1 extends integrally and vertically from one end face of a solid base part 5 which is of substantially parallelepipedic form. Thus, immediately after moulding and before use, the device in side elevation is generally of L-form with the base part 5 at the foot of the L as seen in Figure 1. The base part 5 is formed with a suitable hollow seating 6 which may be part-cylindrical, as shown, when a tube or cable is to be clipped or clamped,

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as in Figure 3. Beneath the seating 6 a slot 7 may be formed through the base 5 to permit of a degree of resiliency of the seating 6. A screw threaded hole 8 extends upwardly from the bottom of the base 5 and serves for the reception of a screw or bolt used for fixing the base 5 to a supporting surface such as a wall. Any suitable hole for engagement with other kinds of fixing means could be made in the bottom of the base 5 instead of the screw threaded hole 8. The base 5 is moulded with a widened part 9 at one end, as seen in Figure 2. This part 9 is pierced with an elongated aperture or recess 10, which may be rectangular as shown. That wall of the recess 10 which is nearer to the said end and is parallel to the vertical axis of the clip is formed with a series of ratchet teeth 11 corresponding to, and adapted for engagement with, the series of teeth 3. The length of the blade part 1 must, of course, be such as to enable it to encircle objects of given dimensions for which the clamp is to be used and thereafter to be locked in the clipping position as hereinafter described.

In Figure 3, it will be seen that a tube 12 to be clamped has been placed upon the seating 6 of the base 5 and that the blade or band 1 has been bent to ring form over the tube 12 and so as closely to enclose the latter. The extremity 2 has been introduced into the recess 10 and owing to the resiliency aforesaid, the teeth 3 of the extremity 2 have been forced into engagement with the teeth 11 in the recess 10. The distance between the teeth 11 and the opposite wall of the recess is sufficient for enabling the free end of the blade or band 1 with its bent over extremity 2 to be introduced freely into the recess 10 and to be pressed down by pressure on the knob 4, for example, the ratchet form of the teeth 3 and 11 being favourable for the free introduction. When the blade or band 1 closely encircles the tube 12 the manual pressure thereon is released and the part 2 is then free to exert its tendency to spring outwards and maintain its teeth 3 in engagement with the teeth 11. The ratchet form of the teeth is then effective for preventing unintentional disengagement or loosening of the clamp. The degree of resiliency imparted to the seating 6 by the formation of the slot 7 immediately beneath contributes to a tight clamping of the tube. It will be understood that a screw or other fastening means has previously been engaged in the screw threaded hole 8 or the like for securing the base 5 to a supporting surface such as a wall.

The principle of clipping or clamping and also of locking the clip or clamp when closed, as realized by the present invention, presents a great superiority over known clip devices, as will be clearly understood from Figures 3 and 4. In these figures, it will be seen that when the clip is locked there is a point of contact A between the rounded part of the knob 4 and the blade or band 1, this point being situated at the place where the band 1 commences to extend tangentially downwards from the tube 12 which it encircles. B is a point of contact between the straight end part 15 of the band 1 and the inner wall 13 of the recess 10. r is the radius of the tube 12. a is the horizontal distance between the central vertical axis of the clip and the wall 13. α is the angle which the part 15 of the band 1 makes with the wall 13 and β is the angle which the part 15 makes with the extremity or tongue part 2 of the band when the part 2 is flexed by being forced into the locking position. The clip or clamp is so dimensioned that whatever may be the radius r of a tube or cable to be clipped, the length of such radius is superior to the distance a , it being understood that the said radius must be comprised between the limits of the clipping capacity of a clip or clamp of given dimensions.

By comparing Figures 1 and 3, it will be understood

that when the bent back portion 2 is produced by moulding or otherwise, the angle β' which such part 2 makes with the part 1 will be greater than β , in order to permit of resiliency of the part 2, as indicated by the dotted lines in Figure 1.

It results from the foregoing that if a force in the direction F1 (Figure 3) is exerted on the band 1, the points A and B being the bearing or contact points as above explained, a resultant F2 is produced. This resultant F2 has for its effect to produce a stronger engagement of the upper teeth of the series 3 with appropriate teeth of the series 11 and thereby to make the locking action more secure.

For releasing the clip or clamp from the tube 12 or other object, it suffices to introduce the extremity of a tool beneath the enlargement or knob 4, between the latter and the top of the outer portion of the base 5 and to press back the part 2 in the direction of the arrow F3 in Figure 4. This effects a disengagement of the teeth 3 from the teeth 11, so that the folded end parts 2 and 15 of the band 1 can be withdrawn from the recess 10. The distance c (Figure 4) between the parts 2 and 15 of the band 1 being greater than the depth b of the teeth, it is apparent that the unclipping operation can be performed easily and quickly. When the disengaging pressure is exerted in the direction F3 it will produce a temporary deformation or bending of the part 2 as indicated by dotted lines in Figure 4.

On the other hand, it appears clearly from the foregoing that without a deliberate effort exerted in the direction of the arrow F3, any disengagement of the clip is impossible. Consequently, shocks, vibrations, or pulls exerted upon the cable or tube fixed by the clip, cannot bring about the opening of such clip.

This system of locking, rendered possible by the invention, assures a considerable superiority of clips or clamps of this kind over those already known.

The invention includes, moreover, a process for the manufacture of a ring clip or clamp of the general type described above, consisting in running an appropriate plastic material, preferably and for example such as nylon, into a mould comprising a cavity of generally parallelepiped section in which cores permit of obtaining hollows of desired form and an elongated groove connected with the cavity at one of its faces, in such manner as to obtain a long blade, narrow and thin, of flexible plastic material and in one piece with a rigid block, then to finish the collar by shaping parts not capable of being obtained satisfactorily by moulding in their final form, for example by screw threading certain holes.

What I claim is:

1. A ring clamp moulded as a single piece from syn-

thetic plastic material comprising: a rigid base of substantially parallelepiped form; recessed means in said base for attaching it to a supporting surface; an elongated recess in said base near one first end thereof, the internal wall of said recess nearer said first end having a first toothed formation; a thin, narrow, flexible band having one end integral with the second opposite end of said base and extending from said opposite end to a second free end, said free end having a second toothed formation; a seating surface on said rigid base between the innermost wall of said recess and said band; said second toothed formation being formed on a resilient extension of said free end, said resilient extension being bent outwardly of said free end and toward said rigid base; said flexible band being adapted for being bent over and around an object seated upon said seating surface and for having its free end and resilient extension inserted into said elongated recess; the flexibility of said band and resilient extension allowing the direct engagement of said first and second toothed formations, whereby said object is securely clamped.

2. A clamp as claimed in claim 1, in which said rigid base and said flexible band respectively form the foot and the upright stem of an L-shaped integral piece; and in which said second toothed formation is located on the outer face of said resilient extension, said extension terminating into an enlarged knob.

3. A ring clamp as claimed in claim 1, wherein said first and second toothed formations are of the ratchet type.

4. A ring clamp as claimed in claim 1, wherein said recessed means is a screw threaded hole having its axis parallel with that wall of the elongated recess which has said second toothed formation, the said hole being disposed between the said elongated recess and said flexible band.

5. A ring clamp as claimed in claim 2, wherein said resilient downward extension when formed makes with said band an angle greater than that which it makes with said band when said free end and its resilient extension are engaged in the elongated recess in the base.

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