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(54) Adjustable clamp for assembling structures including a plurality of parts, particularly for frames and frameworks.

(57) This adjustable clamp for assembling structures including a plurality of parts, particularly for frames and frameworks, comprises a band (2) unreeled from a feed reel (3) and wrapping up the surface of a structure (4) to be assembled preferably around elements (5) countershaped to any corners of said structure, said band (2) passing through a traction element (7) to which a band end (8) is also connected. The traction element is slidably associated with guides (14,15) protruding from an element (11) which can be fixed to the structure (4) and to which said traction element (7) is adjustably associated by a screw actuation element (9). According to the invention, insertion-coupling means are provided, adapted to rigidly associate said reel (3) and said traction element (7), with lever means adapted to lock the portion of said band (2) which traverses said traction element (7) and with wedge means (35) adapted to lock the band end (8).

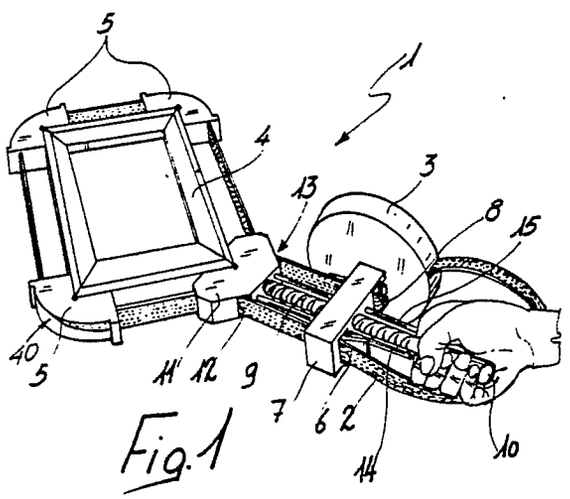

Fig.1

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ADJUSTABLE CLAMP FOR ASSEMBLING STRUCTURES INCLUDING A PLURALITY OF PARTS, PARTICULARLY FOR FRAMES AND FRAMEWORKS

The present invention relates to an adjustable clamp particularly usable for the assembly of the various parts which constitute frames or frameworks in general, during their manufacture.

The aim of the present invention is to provide an adjustable clamp which is characterized by considerable ease in operation by the user.

A consequent primary object is to provide an adjustable clamp which can be used to produce a vast range of frame or framework shapes.

Another important object is to provide a clamp which is composed of simple elements which can be rapidly assembled even by its operator so that it can be marketed in an assembly kit.

Still another object is to provide an adjustable clamp which is characterized by low production costs which allow to market it at competitive prices.

Not least object is to provide an adjustable clamp which can be conveniently and preferably manufactured as a whole by injection-molding thermoplastic materials.

This aim, these objects and others which will become apparent hereinafter are achieved by an adjustable clamp particularly for frames and frameworks as defined in claim 1.

The characteristics and advantages of the invention will become apparent from the detailed description of a preferred embodiment, illustrated only by way of non- limitative example in the accompanying drawings, wherein:

figure 1 is a perspective view of the adjustable clamp according to the invention, during its use;

figure 2 is a perspective view of an element countershaped to the corners of a square or rectangular frame, and of an element which can be connected thereto for the assembly of a pentagonal frame;

figure 3 illustrates two perspective views of an auxiliary element adapted to retain corners of any breadth;

figure 4 is a perspective view of the adjustable clamp structure of figure 1 during the coupling of a band feeding reel;

figure 5 is a perspective view of the adjustable clamp of figure 1, from which the elements for locking the band to a traction element are removed.

With reference to the above indicated figures, the adjustable clamp according to the invention is generally indicated by the reference numeral 1 and essentially comprises a band 2, preferably made of synthetic fabric, which can be unreeled from a feed reel of which only the outer container 3, from which the band protrudes, can be seen in the figures; said band wraps up the outer perimeter of a rectangular frame 4 around elements 5 countershaped to the frame corners.

Said band, before wrapping up said frame 4, and after leaving the container 3, passes through a hole 6 provided in a substantially parallelepipedal traction element 7 to which the end 8 of the band is also connected.

Said traction element 7 is centrally traversed by a threaded hole in which an actuation screw 9, provided with an end handle 10, is screwed.

The end of said screw 9 which is opposite to the handle 10 is rotatably associated, by means of an elastic ball coupling, to an element 11 which is fixed with respect to said frame 4, since it is connected to one of the corners in the same manner as the elements 5 and has lateral holes, respectively 12 and 13, in which said band 2 is caused to pass.

Guiding elements, respectively 14 and 15, extend from said element 11 parallel to said actuation screw 9 and laterally thereto, and conveniently comprise metal rods which pass through corresponding holes of said traction element 7, allowing it to move to and from element 11.

The elements 5 have a substantially L-like shape defining an outer groove 40 for guiding the band 2 and an inner recess 41 intended to rest against one corner of the frame. The recess 41, which defines a right angle, has, on each angular resting surface, holes 16 allowing, if required, the insertion of dowels 17 which extend from corresponding elements 18 (see figure 2) which are shaped so as complementarily define angles of any value, e.g. to clamp frames having a pentagonal or conveniently hexagonal or even octagonal figure.

Both elements 5 and 18 may be replaced by an angle element 19, illustrated in figure 3, comprising two elements, respectively 20 and 21, joined by a flexible lamina 22; each element has a resting base 23 on one side, intended to rest against the frame, and lateral guides 24 on the other side for the band 2.

According to the invention, two raised portions 25 and 26 extend from a planar surface of said container 3 in a middle region thereof, symmetrically with respect to its center; said raised portions have an L-shaped cross section and are adapted to fittingly insert in complementarily shaped seats 27 and 28 provided on said traction element 7 proximate to the portion accommodating the end 8 of the band.

The hole 6 is shaped so that it can pivotably accommodate the rotation axis 29 of a lever 30 having a toothed formation 31 which is arranged to face said band 2 and is adapted to lock it on one side of the hole, also as an effect of the compression of a spring 32 which pushes said lever 30 from the surface opposite to the toothed formation 31.

By rotating the lever in contrast with the action of the spring, said band 2 is released and can thus slide freely in the hole 6.

Furthermore the end 8 of the band 2 has a loop 33 and is inserted in a hole 34 which traverses said element 7 on the opposite side with respect to said hole 6.

On the side opposite to the insertion one, said hole 34 defines a wedge and is adapted to accommodate a complementarily shaped wedge-like locking element 35 inserted in said loop 33.

The operation of the adjustable clamp structure according to the invention is very simple and immediate and can be summarized as follows.

The band 2 is unreeled from the reel of the container 3 and is passed through the hole 6 of the traction element 7, through the hole 12 of the fixed element 11, around each element 5 on the outside of the frame 4 and then returns through the hole 13 of the element 11 and through the hole 34 of the element 7.

After these operations have been completed, the wedge-like element 35 is inserted in the loop 33 and then accommodated in the complementarily shaped seat of the hole 34.

At this point, by rotating the lever 30, the band can be released at the hole 6, tensioned and then re-locked.

Thereafter, by operating the actuation screw 9, the traction element 7 induces a tension around the frame 4, which may remain in this configuration for all the time required for a possible glueing of the corners.

A clamp structure according to the invention is also conveniently suitable for frameworks of any shape by using both the elements 5 and the elements 18 or possibly the angle elements 19.

In the case of circular structures, the band 2 may be applied directly to the outer perimetric surface.

From what has been described above it is apparent that the intended aim and objects are therefore brilliantly achieved, an adjustable clamp structure having been provided which is easy to use for the operator; said structure has technical improvements which allow its rapid assembly and disassembly, so that it can also be offered to potential customers in an assembly kit.

In practice, the materials employed, as well as the dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. An adjustable clamp for assembling structures including a plurality of parts, particularly for frames and frameworks, comprising a band (2) unreeled from a feed reel (3) and wrapping up the surface of a structure (4) to be assembled preferably around elements (5;18;19) counter-shaped to any corners of said structure, said band (2) passing through a traction element (7) to which a band end (8) is also connected, said traction element being slidably associated with guides (14,15) protruding from an element (11) which can be fixed to the structure (4) and to which said traction element (7) is adjustably associated by a screw actuation element (9), characterized by insertion-coupling means (25,28) adapted to rigidly associate said reel (3) and said traction element (7), with lever means (30) adapted to lock the portion of said band (2) which traverses said traction element (7) and with wedge means (35) adapted to lock the band end (8).

2. An adjustable clamp according to claim 1, characterized in that said insertion-coupling means comprises L-shaped raised portions (25,26) which extend symmetrically at the center of a planar surface of a reel container (3), said raised portions being mutually parallel and being adapted to be fittingly accommodated in complementarily shaped seats (27,28) provided at one end of said traction element (7).

3. An adjustable clamp according to claim 1, characterized in that said lever means comprise a lever (30) which has, at one end, a rotation axis (29) which can be inserted in a countershaped portion of a hole formed in said traction element (7) for passing said band (2), said lever having a toothed formation (31) facing and locking said band (2) against a side of said hole by virtue of a spring pusher element (32).

4. An adjustable clamp according to claim 1, characterized in that said wedge means comprises a wedge-like element (35) which is inserted in a loop (33) provided on said band end (8) and can be accommodated, together with said band end, in a

countershaped seat provided in a hole (34) of said traction element (7) on the opposite side with respect to the insertion side of said band end.

5. An adjustable clamp according to claim 1, characterized in that said elements (19) countershaped to the corners comprise a pair of parallel elements (20,21) joined by a flexible lamina (22), each element having a resting base (23) on one side and guides (24) for said band (2) on the other.

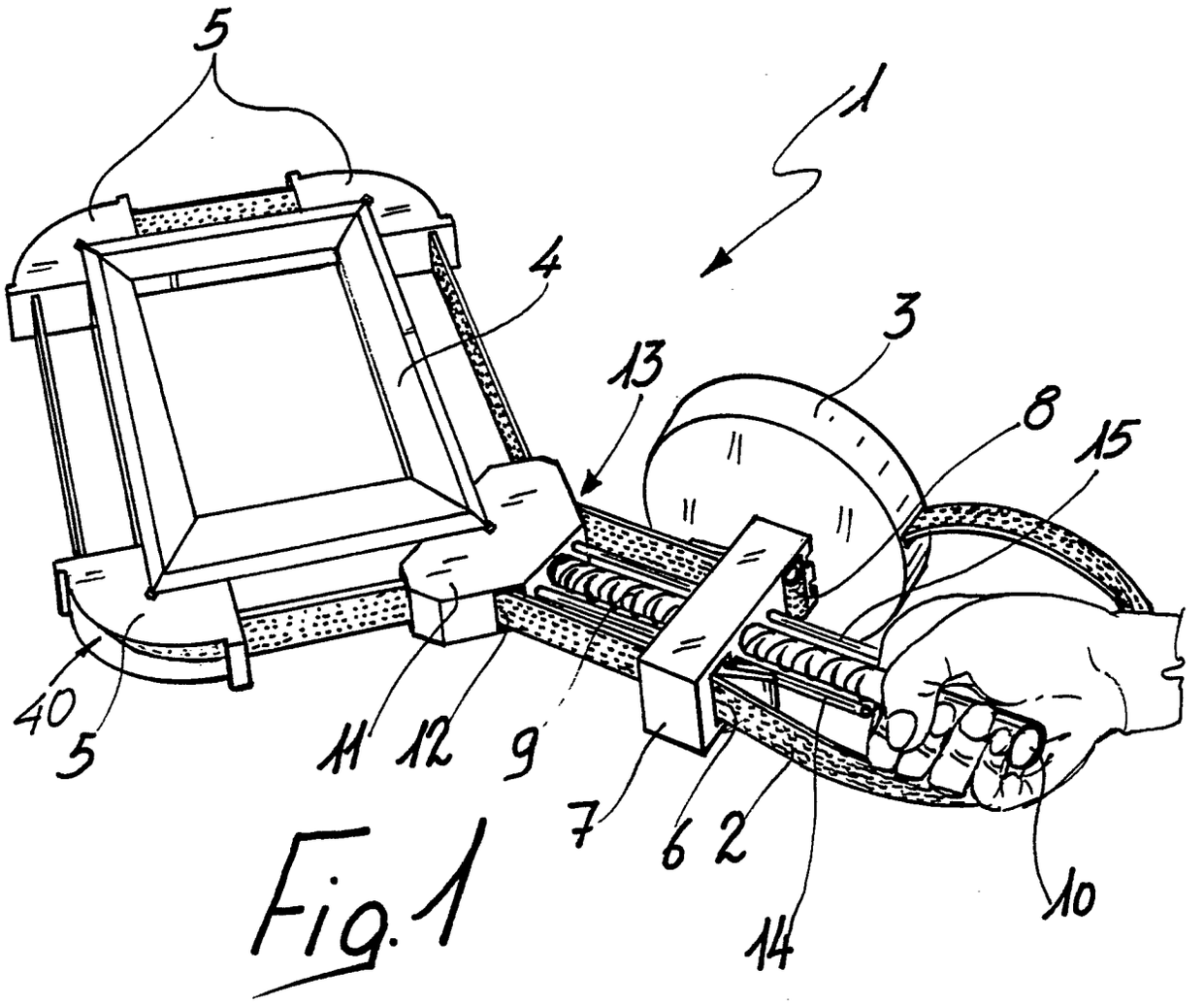

Fig.1

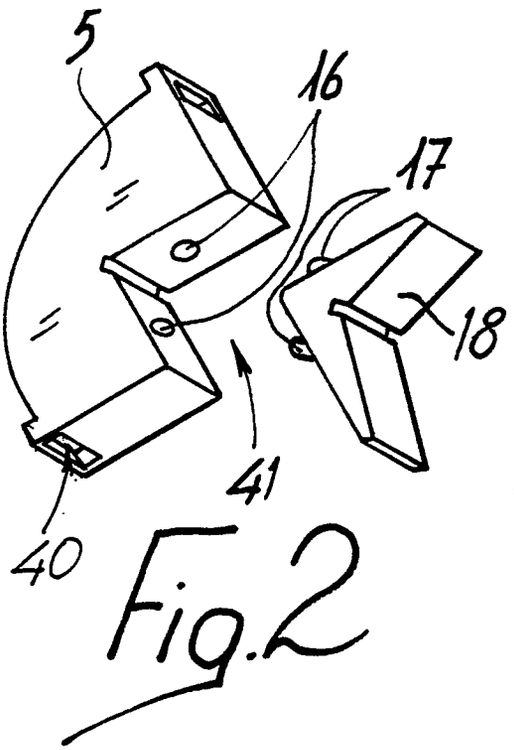

Fig.2

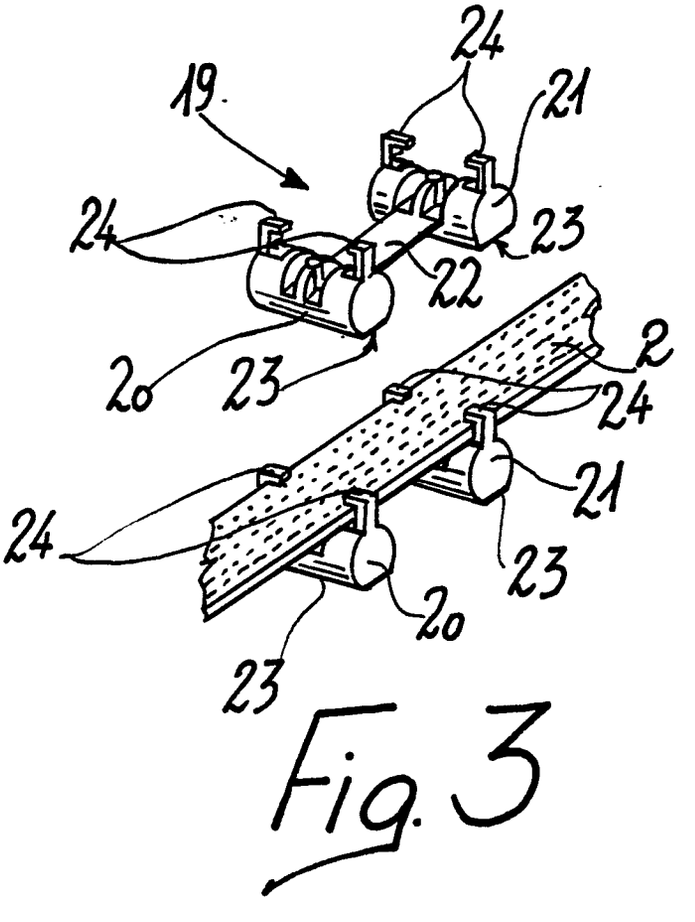

Fig.3

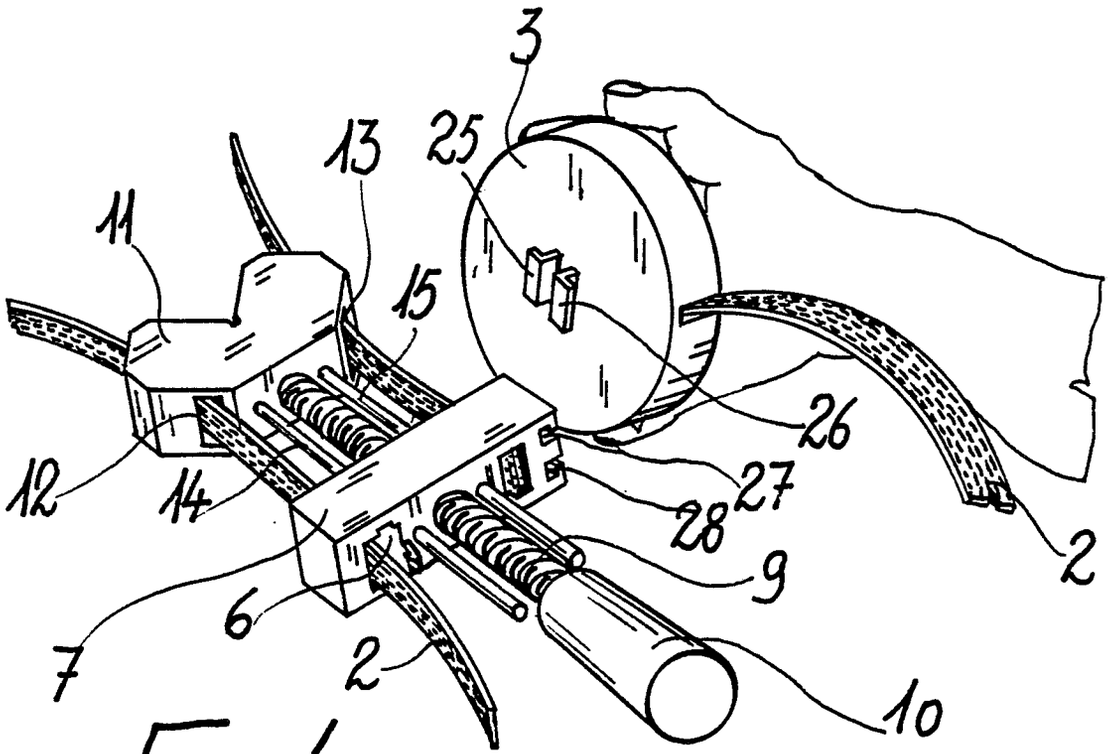
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Fig. 4

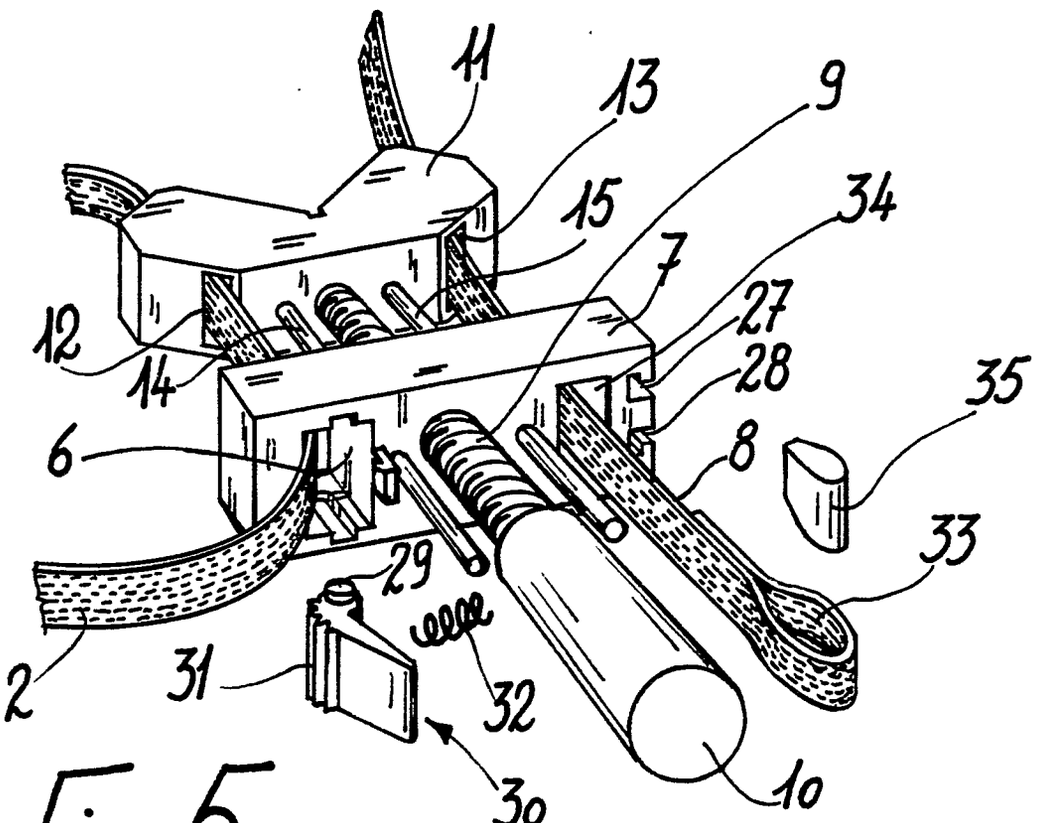
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Fig. 5