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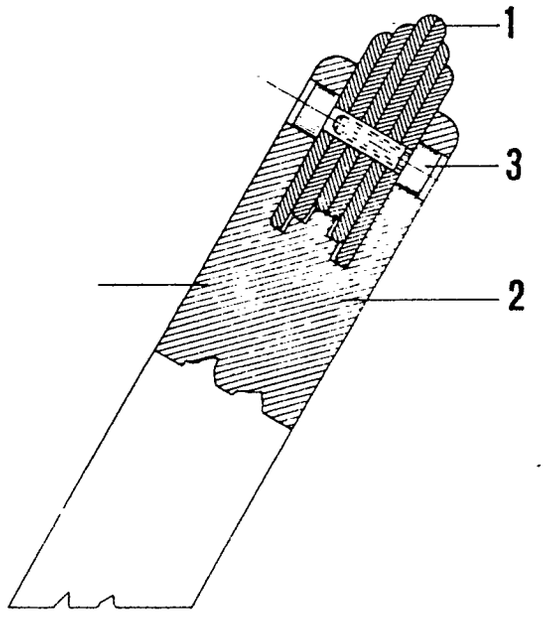
(54) Handrail particularly for helicoidal staircases.

(57) A handrail which, intended to connect the uprights of a spiral staircase, is formed in assembly with a bundle of strips (1,4,8,11,13,16,21,26,35,36,37) with low thickness and simply placed adjacent so as to easily curve them manually according to the helicoid passing through the uprights (2,5,9,12,14,20,25,30,32,34) already fixed to the staircase and the head whereof, shaped according to the transverse profile to be imposed to the bundle which rests thereon, allows the transverse perforation of the handrail and the subsequent fixing to the uprights with coupling means (3,7,10,15,18,23,28) adapted to keep the strips rigidly adjacent.

fig. 2



EP 0 321 593 A1

HANDRAIL PARTICULARLY FOR HELICOIDAL STAIRCASES

The present invention relates to a handrail particularly for helicoidal staircases.

Normally, the banisters of helicoidal staircases are constituted by vertical supporting elements (uprights) fixed to the steps and connected, at their head, by a continuous handrail suitably shaped according to the radius and the inclination of each staircase.

This has hitherto made impossible the prefabrication of the wooden handrail, since even helicoidal staircases with prefabricated composable elements allow a certain variability in the rise and in the step of the steps, the arrangement whereof is therefore adapted to the specific requirements of each individual installation.

In lower-quality spiral staircases, such as iron ones, the handrail is formed with an extruded profiled element in plastic material the flexibility whereof allows its easy adaptation while assembling the staircase,while instead, if a similar handrail is to be provided in wood, assembling times and costs are considerably higher. In fact the wooden helicoidal handrail is formed by glueing wooden strips kept locked together for the time required for drying by adapted clamps.

Subsequently, expert craftsmen execute the shaping according to the required profile, prepare the mortises for the uprights coupling and finally perform the finishing treatments, such as painting, polishing, lacquering or others.

This mode of operation, qualitatively appreciable but onerous, obviously contrasts with what should be a prefabricated composable staircase: a structure completely composed of mass-produced elements assemblable during installation with simple operations of adjustment and assembly.

Indeed to eliminate the above described limitations, the present invention proposes a new type of handrail to be formed with a bundle of strips, having adequate length and low thickness, which are curved manually in assembly during their fixing to the uprights of the banister.

Moreover, the head of the uprights is shaped according to the transverse profile to be imposed to the bundle of strips which rests thereon during the execution of the holes to be provided, with a drill and at the holes of the uprights, to allow the insertion therein of adapted screw means by means of which the bundle of strips is fastened and fixed to the uprights.

The face-to-face fastening of the strips provides the handrail with the required solidity, while the offsets in the packing allow to obviate, in an aesthetically appreciable manner, the difficulties of a perfect alignment of all the strips when the bundle is subject to the combined stresses of helicoidal curving.

It must be added that, even by providing the alignment of the edges during the perforation for assembly, this alignment would have in any case an interim nature due to the differentiated shrinkages of the strips arranged side to side to form a handrail.

Once the helicoidal curvature of the strips has been performed, it is sufficient to intervene with a saw at one or both ends of the handrail so that they precisely reach the adapted seats or the simple recesses of the two staircase-head uprights.

Further details will become apparent from the description of some embodiments, illustrated only by way of non-limitative example in the accompanying drawings, wherein figures 1 to 16 show, for each example, a lateral view of the coupling of the handrail with one of the intermediate uprights; a transverse cross section referring to the preceding figure; and figures 17-18 are cross-sectioned views of four different handrails according to another aspect of the invention.

The example of figures 1 and 2 illustrates a handrail formed by a bundle of wood strips 1 identical to one another and symmetrically offset in height since they repeat the inner profile of the fork-like head of the upright 2. The screw coupling element 3 is provided with heads with hexagonal recess which, though trapped in the appropriate holes of the upright, only perform the locking of the strips.

In the example of figures 3 and 4 the handrail, formed by the bundle of strips 4, is fixed to the upright 5 by means of a screw coupling element 7 the heads whereof, with hexagonal recess, act lockingly on the upright and on the removable insert 6.

The example of figures 5 and 6 illustrates a split handrail the strips 8 whereof are divided into two specularly identical groups locked by the screw means 10 against the two outer faces of the upright 9, suitably narrowed, in the region affected by the coupling, with a step-like pattern which determines the offset of the strips.

If required, in order to further stiffen the handrail, simple spacers, to be interposed and fixed to the two groups of strips, are used.

In all the uprights described up to now, the offset of the strips of the handrail is determined by their resting on the shaped profile preset, inside or outside said uprights, according to the required offset and to the inclination of the staircase.

Though the inclination set on the uprights does

not condition in any way the one adopted in each case for the handrail, however the solution of figures 7 and 8, illustrating the strips 11 of the handrail inserted and fixed to the head of the upright 12, the offsetting profile whereof has a convex curvilinear pattern, may be preferable, most of all for the aesthetical aspect.

Figures 9 and 10 illustrate the strips 13 of the handrail fastened and fixed, by the screw means 15, against a depressed region of the upright 14 downwardly delimited by as many concentric curved steps as there are strips to be offset. Said steps then continue along the upright, lightening its cross section and making the combination with the handrail more harmonious.

The example of figures 11 and 12 illustrates a handrail formed by the bundle of offset strips 16, tangentially resting in the steps provided in the rounded end of the upright 20 at the center whereof a hole is provided for the screw means 19 which pivot the two lateral blocks 17 which lock, by virtue of the screw means 18, the bundle of strips 16.

The example of figures 13 and 14 illustrates a handrail formed by the bundle of offset strips 21 inserted and locked, by means of the screw means 23, in the element 22 which also couples astride the rounded head of the upright 25 in which it is pivoted by the screw means 24.

The example of figures 15 and 16 illustrates a split handrail the strips 26 whereof are divided into two specularly identical groups locked, by virtue of the screw means 28, to the two sides of the element 27 suitably shaped so as to effect the offset of the strips and also to be coupled fork-wise to the rounded head of the upright 30 where it is pivoted by the screw means 29.

As for other split handrails, also in this case spacers, to be interposed and fixed to the two groups of strips, can be used if required.

Since the illustrated and described examples show only some of the different possible embodiments, the invention must therefore be understood to extend also to all those modifications and variations not illustrated but equally comprised within the scope of the invention.

It is convenient to consider, among the possible variations of the invention, also the possible use of removable shaped elements which, alternately to the shaped resting in the uprights, would determine the offset of the strips during perforation and insertion of the screw coupling means.

Finally the possible combination is not excluded of the wooden strips with other ones in plastic or in other suitable material, to be interposed among the first ones, to give greater consistency to the bundle-handrail or, more simply, to achieve an aesthetical characterization.

The offset of the strips can also be obtained by using strips 37 of different height resting on a substantially planar resting region 31 of the upright 32 as illustrated in figures 17,19 and 20, or on a substantially concave resting region 33 of the upright 34 as illustrated in figure 18.

In figure 19 a handrail is shown having the strips 35 of different height, the tops whereof are shaped so that the higher strips overlap the lower ones; this way, if the strips are not perfectly side to side, the overlapping conceals the imperfection occurred in assembling.

Figure 20 shows a different way of overlapping the tops of the strips 36, the inner strips 36b having dents housing corresponding projections of adjacent strips 36a; the strips 36b also have projections engaging corresponding dents formed in the central strip 36c.

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 examples by such reference signs.

Claims

1. Handrail, particularly for helicoidal staircases characterized in that it comprises a plurality of strips (1,4,8,11,13,16,21 ,26,35,36,37) having a length no shorter than the extension of the entire helicoid of said staircase, arranged adjacent face to face and manually curved in assembly during the positioning in the appropriate seats (31) of the uprights (2,5,12,9,14,20,25,30,32,34) of the banister where they are perforated for the insertion of coupling means (3,7,10,15,18,23,28) with which to lock and fix them to said uprights.

2. Handrail, according to claim 1, characterized in that said strips (1,4,8,11,13,16,21,26,35,36,37) are arranged so as to have marked offsets determined by the uprights' seat profile on which they rest.

3. Handrail, according to one or more of the preceding claims, characterized in that the strips (1) are offset by virtue of the transverse profile of the rest provided inside the fork-like head of the upright (2) wherein they are locked with screw coupling means (3) passing through the holes of the uprights and acting on the outer strips of the crossed bundle.

4. Handrail, according to claims 1 and 2, characterized in that the strips (4), offset by the resting on the upright, are fixed to said upright with screw

coupling means (7) the heads whereof rest, to lock, against the upright and against the removable insert (6).

5. Handrail, according to claims 1 and 2, characterized in that the strips (8) are divided into two groups and locked, by the screw coupling means (10), against the upright (9) interposed between the two groups and shaped according to the offset to be imposed to the strips.

6. Handrail, according to claims 1 and 2, characterized in that the seat for the offset resting of the strips (11), preset in the fork-like head of the upright (12), has a curvilinear convex pattern, suitable for any inclination of the handrail.

7. Handrail, according to claims 1 and 2, characterized in that the strips (13) are locked and fixed, with the screw coupling means (15), against a depressed region of the upright (14) downwardly delimited by a succession of curved and concentrical steps dimensioned according to the thickness of the strips which rest thereon and according to the offset to be provided.

8. Handrail, according to claims 1 and 2, characterized in that the strips (16) rest, offset, on the steps preset in the rounded end of the upright (20) to the center whereof are pivoted the two lateral blocks (17) which, by means of the screw coupling means (18), rigidly associate and lock the bundle of strips.

9. Handrail, according to claims 1 and 2, characterized in that the strips (21) are inserted and offset, as well as locked by means of the screw means (23), in the element (22) which also couples astride to the rounded head of the upright (25) in which it is pivoted.

10. Handrail according to claims 1 and 2, characterized in that the strips (26), divided into two groups, are fastened, by the screw coupling means (28), to the two sides of the element (27) conveniently shaped to effect the offset of the strips and also to be coupled fork wise by the fork-like head of the upright (30) in which it is pivoted.

11. Handrail, according to claim 1, characterized in that said strips are arranged so as to have marked offsets determined by adapted shaped elements applied temporarily to the bundle of said strips and removed after fixing to the uprights.

12. Handrail,according to one or more of the preceding claims, characterized in that said strips (37) have different height, said seat (31) having a substantially rectangular section.

13. Handrail,according to one or more of the preceding claims, characterized in that said strips (35) have a shaped edges overlapping the adjacent strips when assembled.

14. Handrail ,according to one or more of the preceding claims, characterized in that said strips (36) have longitudinal dents at their tops adapted to house corresponding projections, formed in said strips (36) when assembled.

fig. 1

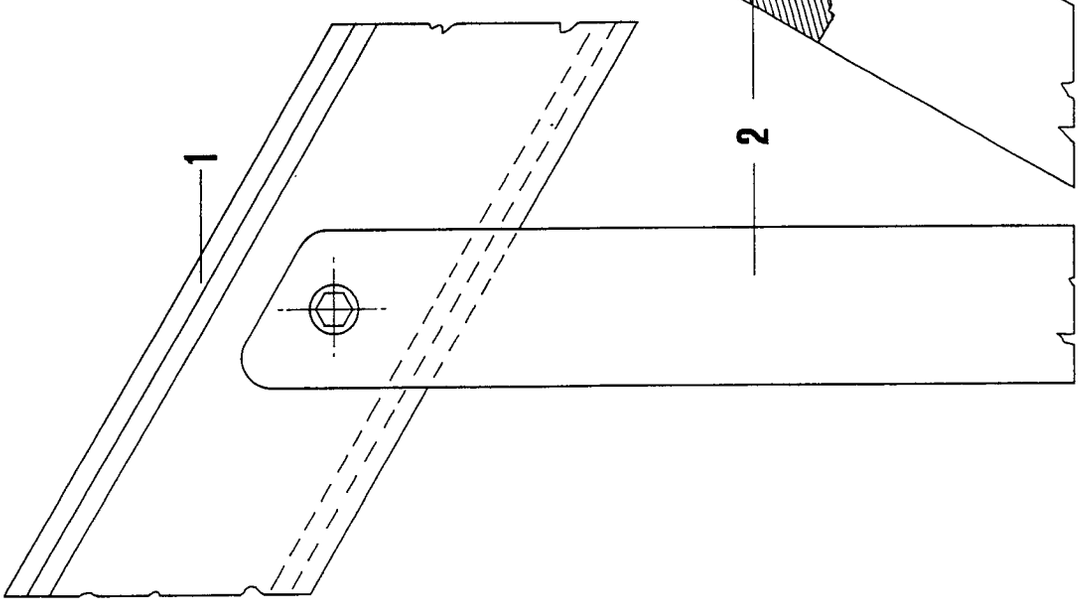


fig. 2

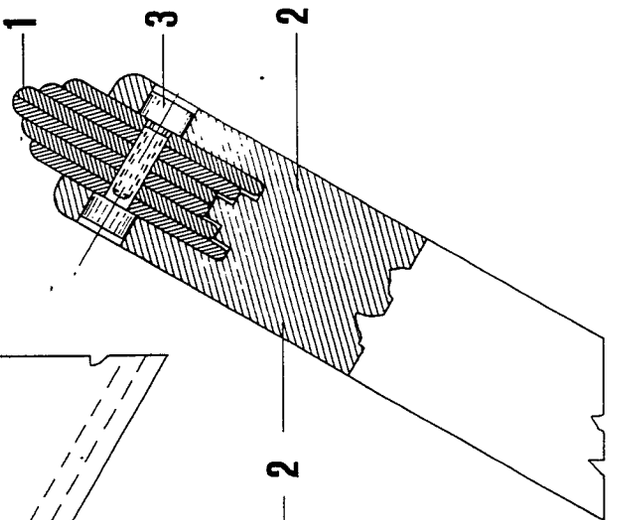


fig. 3

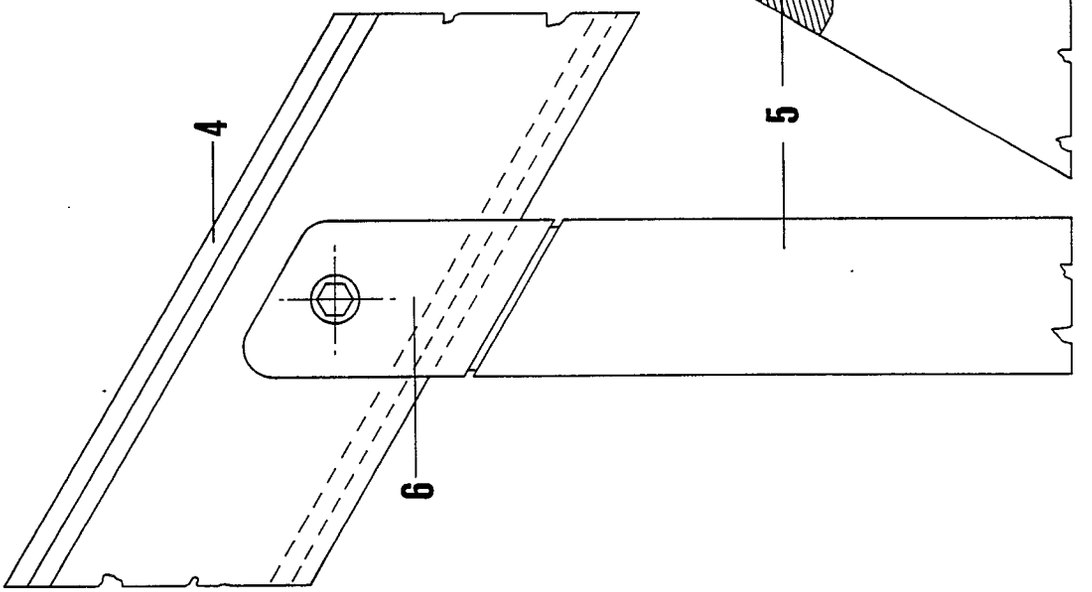


fig. 4

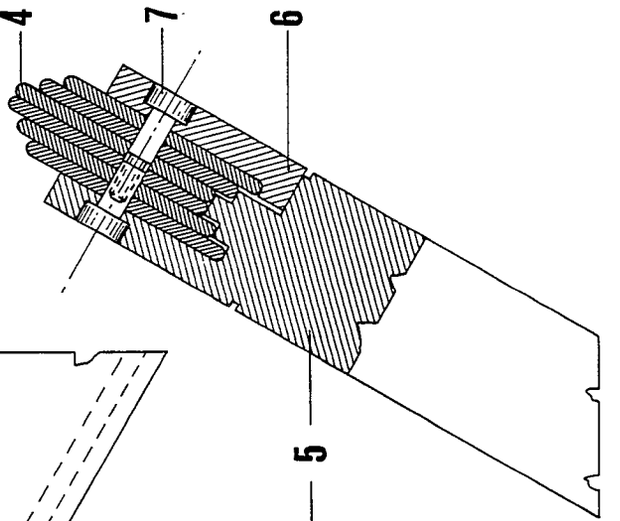


fig. 5

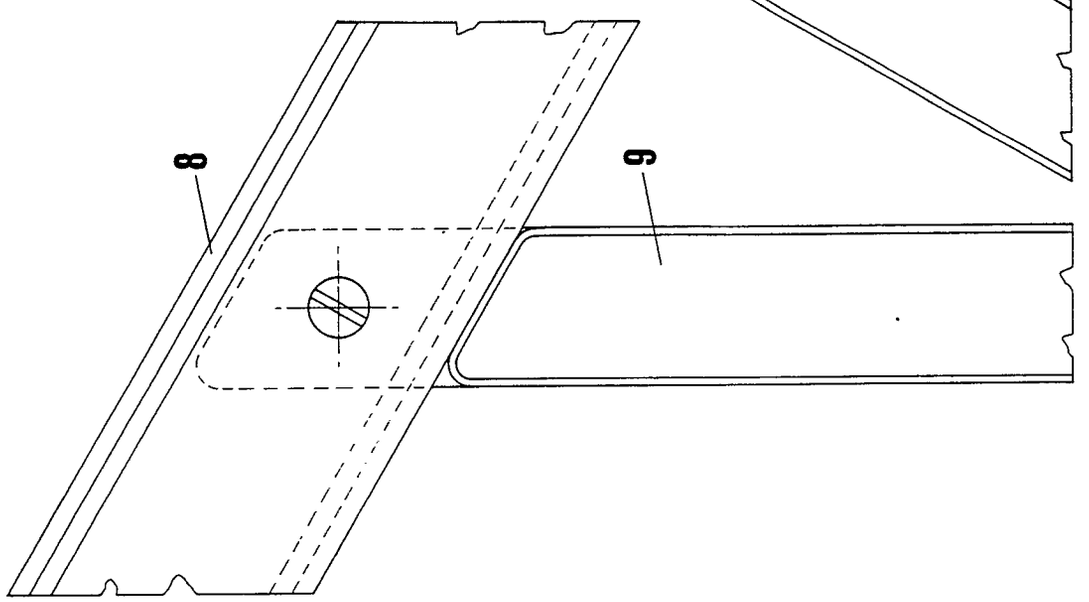


fig. 6

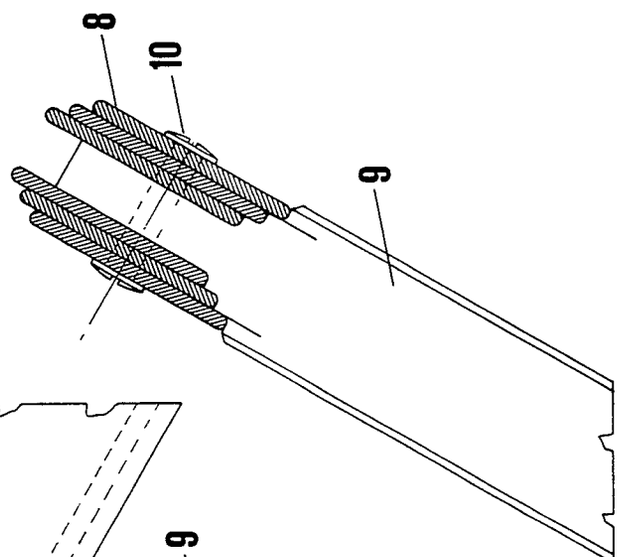


fig. 7

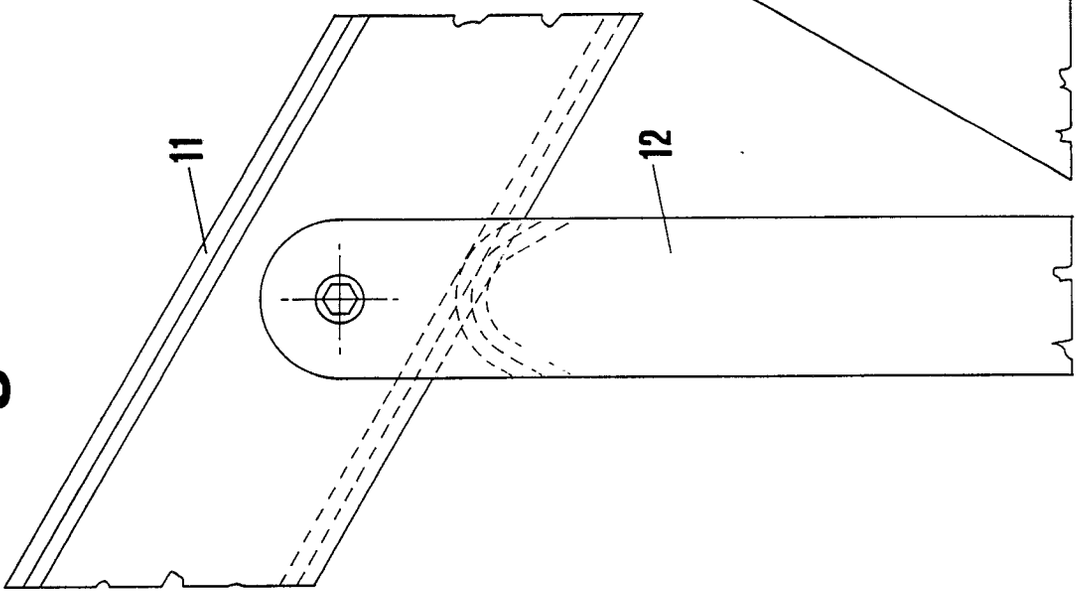


fig. 8

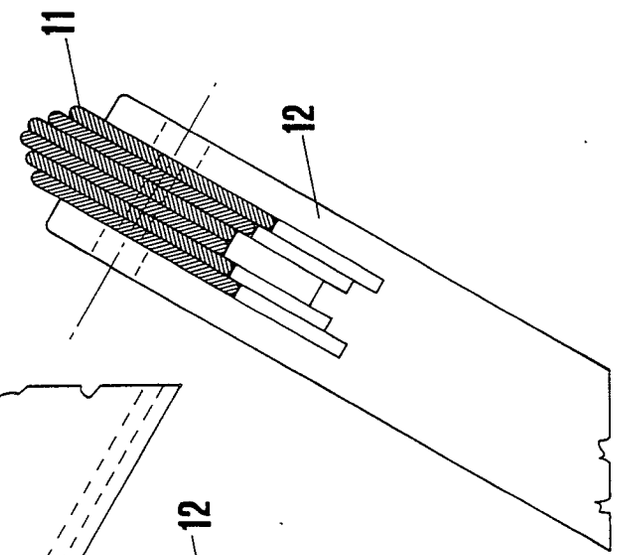


fig. 9

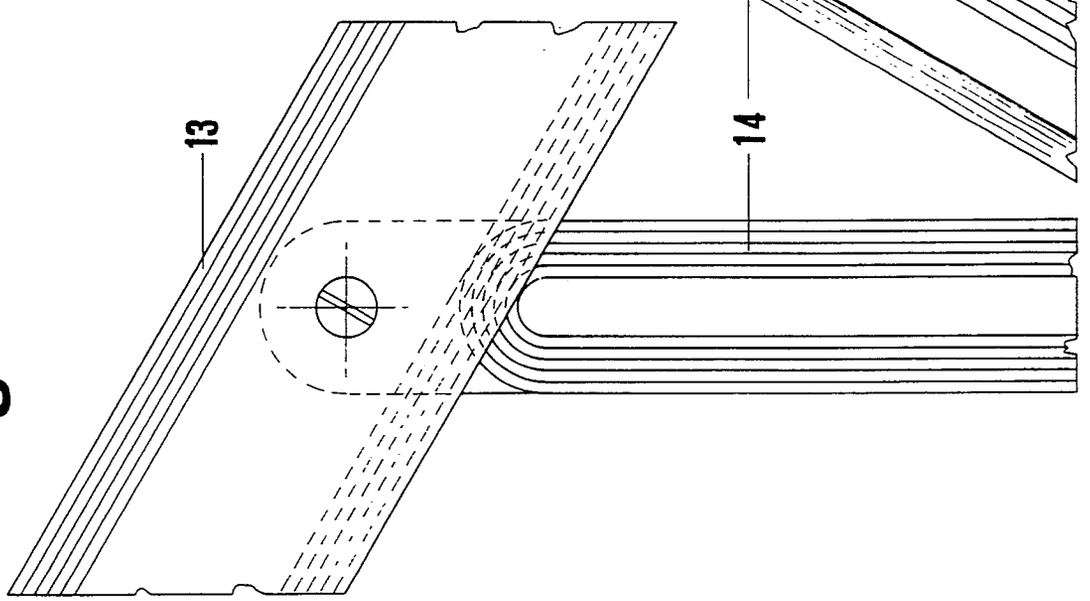


fig. 10

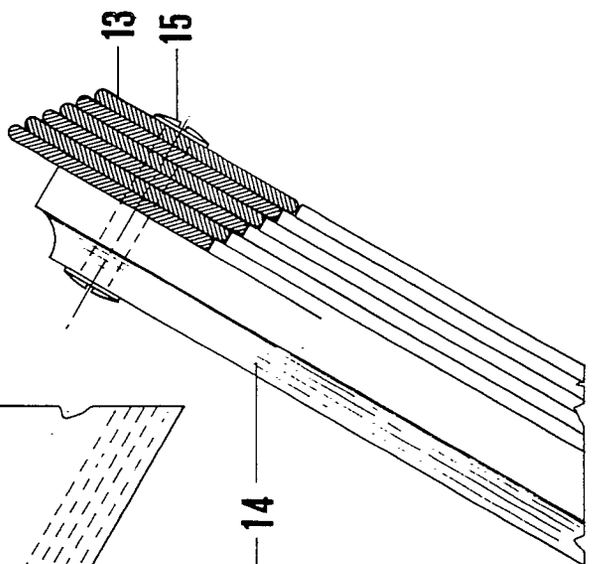


fig. 11

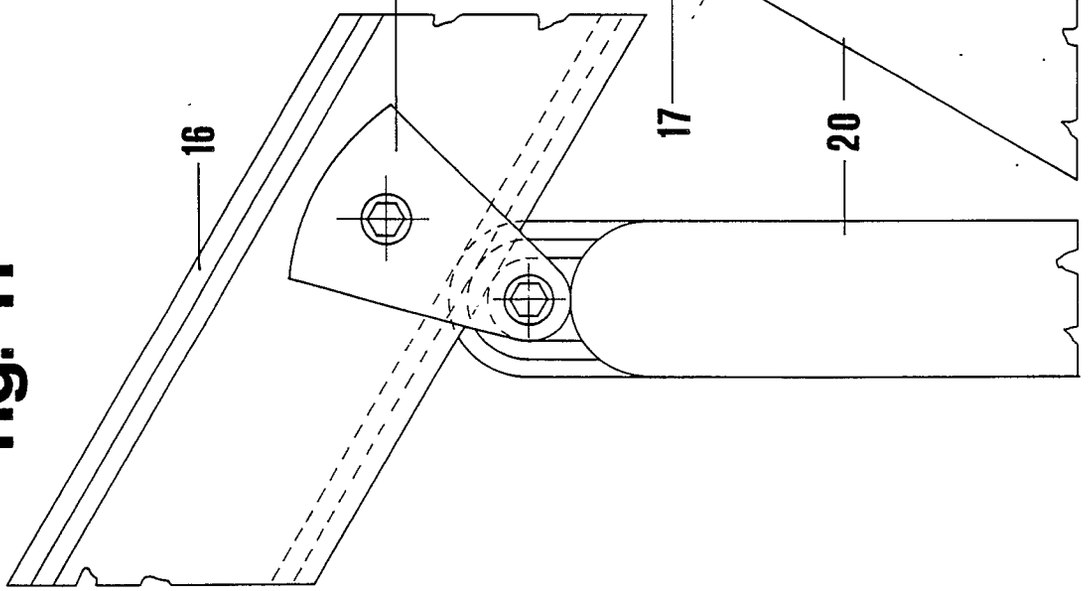


fig. 12

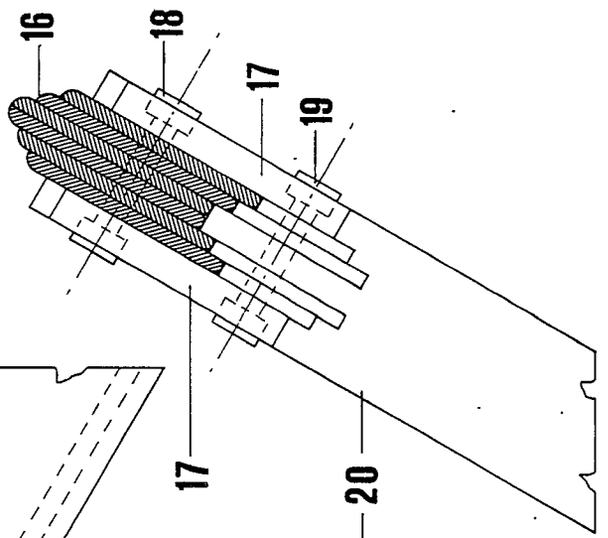


fig. 13

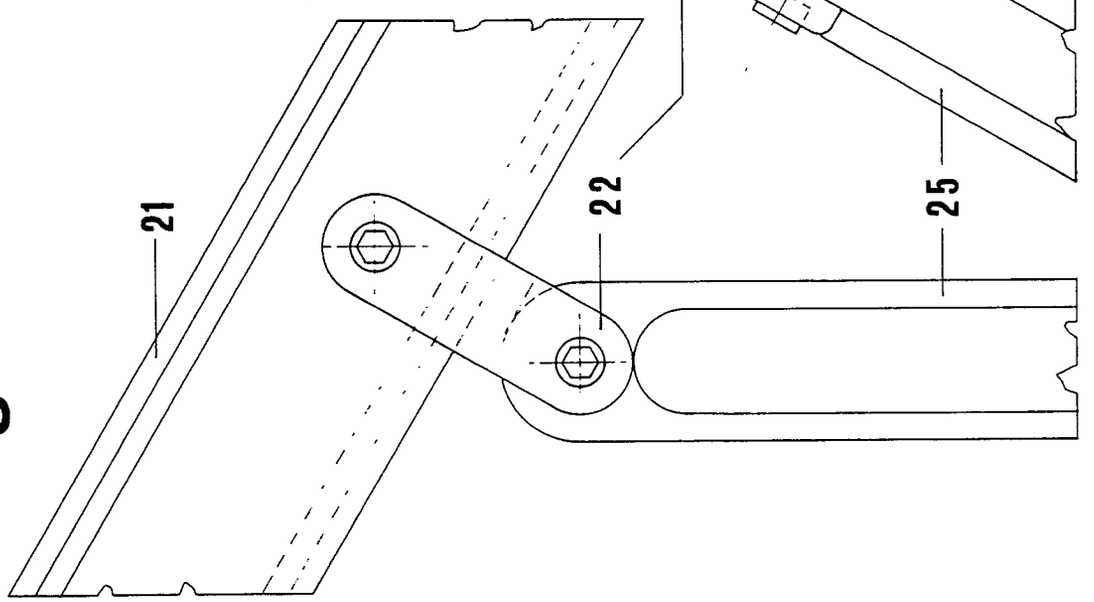


fig. 14

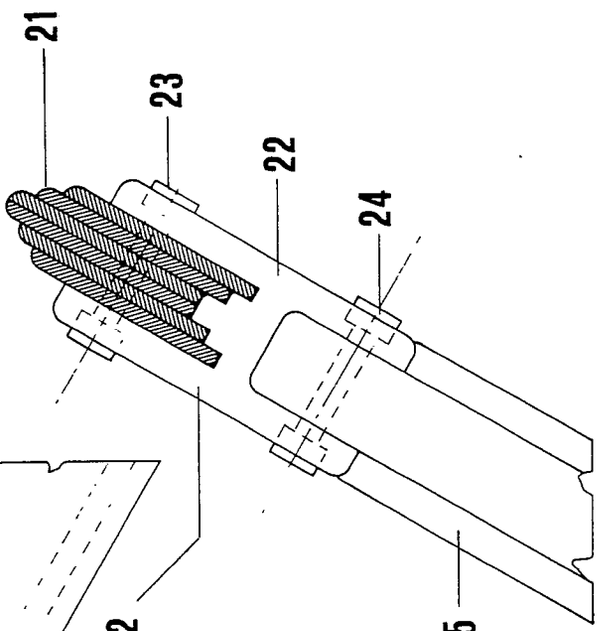


fig. 15

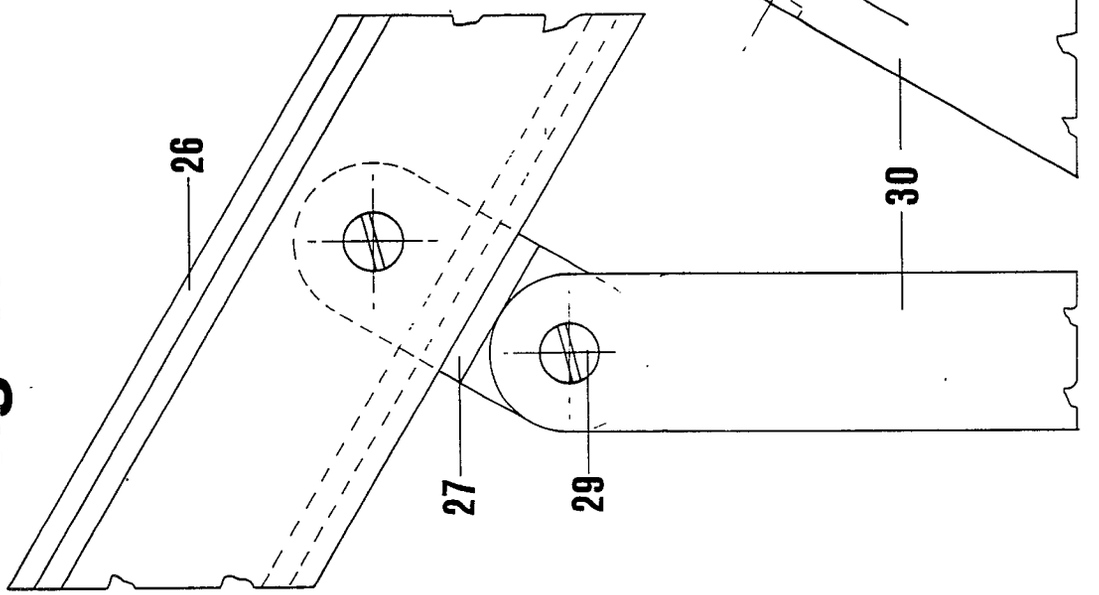


fig. 16

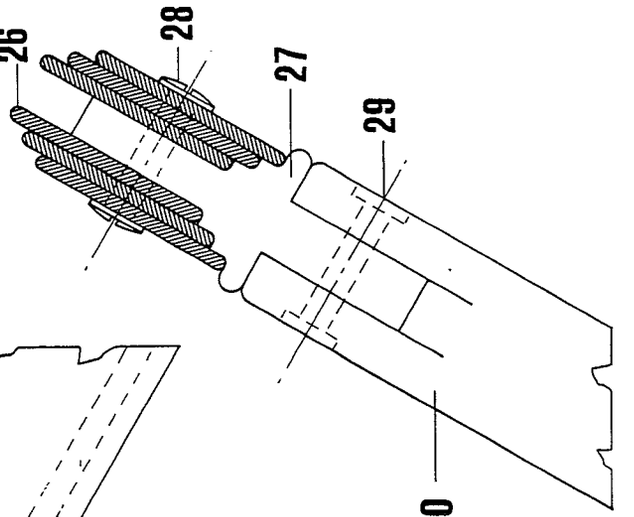


fig. 17

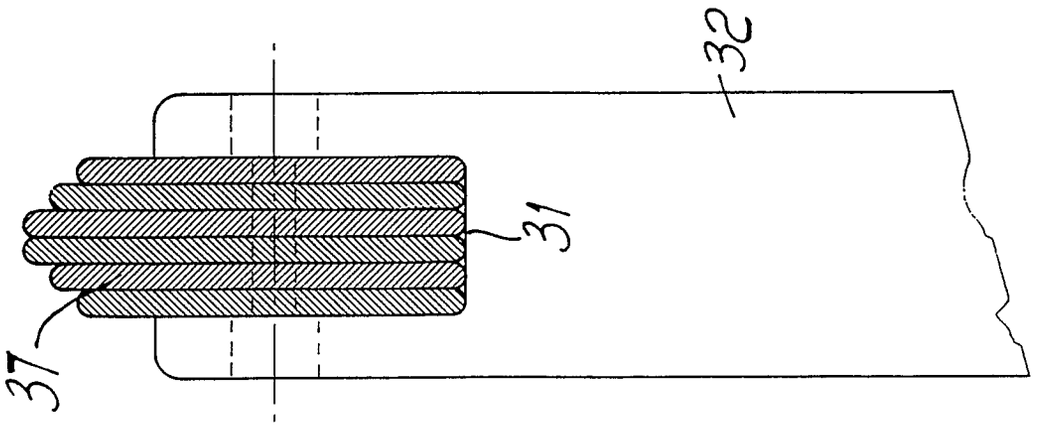


fig. 18

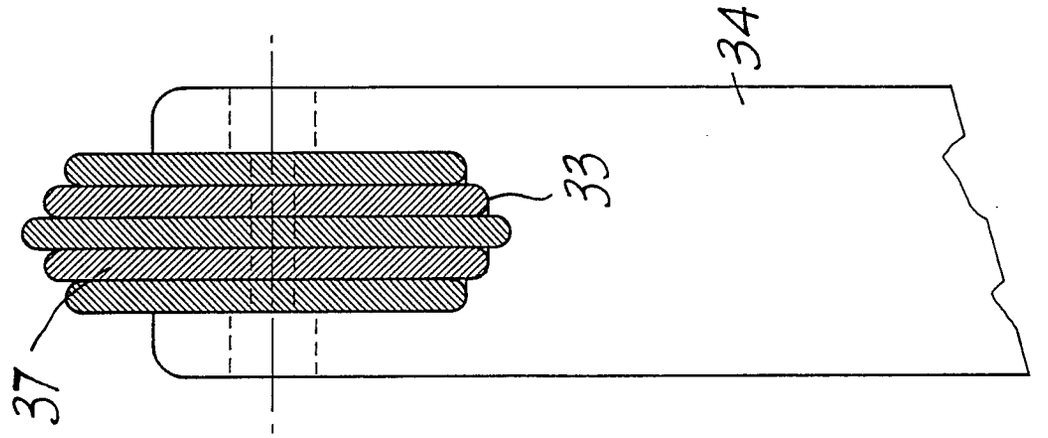


fig. 19

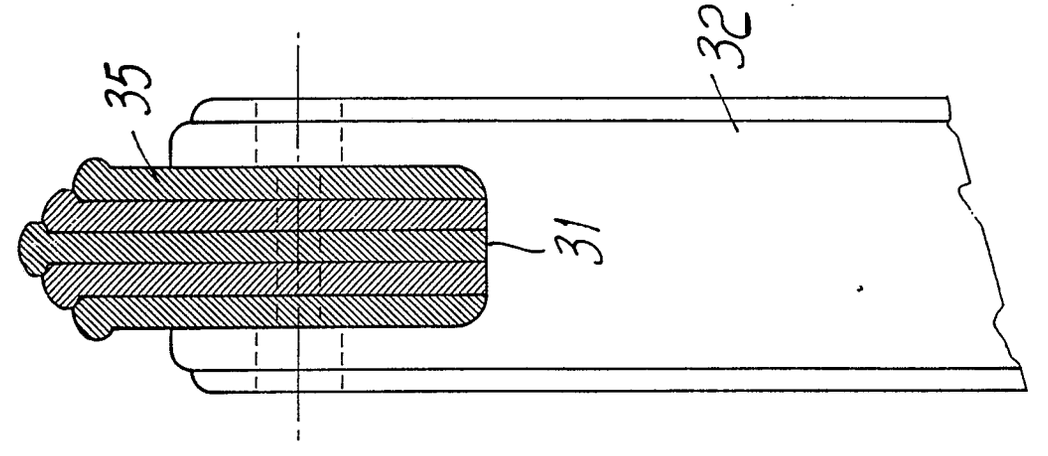
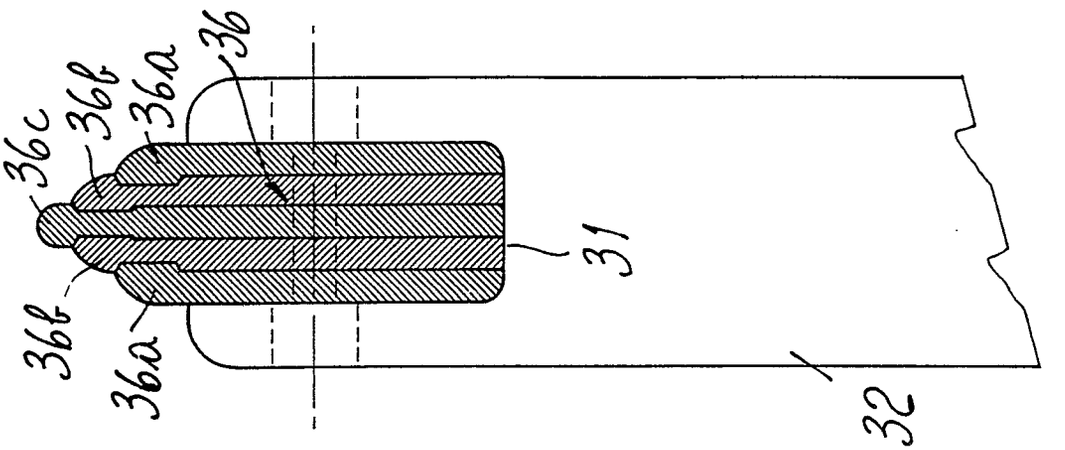


fig. 20



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EUROPEAN SEARCH REPORT

Application Number

EP 87 11 8801

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	US-A-3 879 026 (LAPPIN, Jr.) * Column 2, lines 1-44; column 3, line 16 - column 7, line 3; figures 1-10 *	1	E 04 F 11/18 B 27 M 3/12
A	US-A-3 922 453 (SEERY) * Column 2, line 16 - column 4, line 19; figures 1-5 *	1	
A	DE-A-3 147 259 (A. SOMMER GEFORMTES HOLZ) * Page 7, line 1 - page 10, line 10; figures 1-4 *	1	
A	US-A-4 193 585 (EANDI) * Column 3, line 66 - column 5, line 14; column 6, line 29 - column 7, line 3; figures 3,10,11,12 *	1,6,8,9	
A	FR-A-2 206 771 (PACE) * Page 1, line 12 - page 2, line 33; figures 1-4 *	1,3,4, 10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	GB-A-1 516 132 (CONDER GROUP SERVICES) * Page 2, line 66 - page 3, line 47; page 3, line 82 - page 4, line 10; figures 1,2,3,9,11,12 *	1,6,8,9 ,10	E 04 F B 27 M
A	DE-A-2 259 211 (WELLHÖFER & OHLHAUT) * Page 5, line 13 - page 7, line 22; figures 1-4 *	1,6,8,9	
A	DE-C- 377 624 (JOHANSSON)		
A	FR-A-2 213 144 (ETABLISSEMENTS VEUVE DESBARRES-PRIVE)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	16-08-1988	AYITER J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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