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(54) **A press for inserting cleats into frameworks and cleats for use therewith.**

(57) A press for inserting a cleat into a joint of a framework is described comprising a frame (1) supporting releasable clamping means (2) positioned over locating jigs (3) for receiving two window sections (4, 5). The mitred ends of the sections (4, 5) are held by the clamping means (2) in a jointing position and are assembled by inserting a cleat or cleats by means of a power operated cleat insertion

tool (9) connected by a yoke with a pneumatic piston and cylinder assembly into preformed slots (6, 7) in the mitred ends of the sections (4, 5). A cleat is also described comprising a flat plate rounded at one end with two grooves extending axially of the cleat. Two ribs are formed on each side of the cleat which diverge towards the rounded end of the cleat, the ribs being tapered to form cutting surfaces.

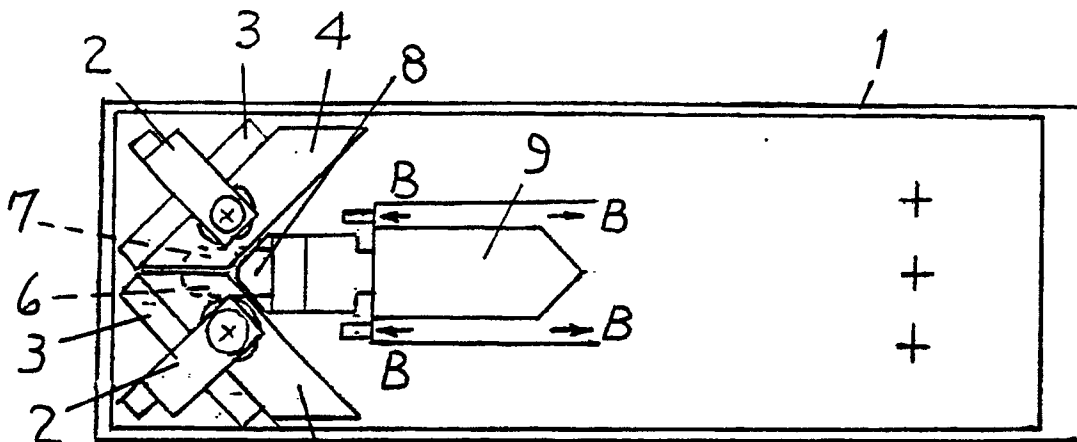


FIG. 2.

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A PRESS FOR INSERTING CLEATS INTO FRAMEWORKS AND CLEATS FOR USE THEREWITH

This invention relates to a press for inserting cleats into framework joints more particularly but not exclusively in wooden framework joints, and to an improved cleat for use therewith.

Over recent years there has been an increase in the mass production of readymade frameworks for installing window frames and conservatories. A common feature of such readymade frameworks is the mass production of the framework sections with mitred joints which were hitherto joined together using glue and screws. This had the disadvantage that it was time consuming, costly and required a skillful tradesman to assemble the framework joints.

Aim aim of the present invention is to provide a press for inserting cleats into framework joints and an improved cleat for use with such presses which overcomes the above disadvantage.

According to one aspect of the present invention there is provided a press for inserting a cleat into a joint of a framework, comprising a head having releasable clamping means to hold at least two framework sections in a jointing position, a power operated cleat inserting tool for receiving the or each cleat to be inserted into a preformed slot in the framework joint, the cleat insertion tool being movable between an insertion position and a retracted position by a power operating means.

Preferably, the power operating means is a pneumatically operated piston and cylinder assembly.

In one preferred embodiment the cleats are fed to the press in pairs from a magazine.

The press can be manually or automatically operated.

According to another aspect of the present invention there is provided a cleat comprising a flat plate rounded at one end, two grooves extending along the longitudinal axis of the cleat and at least two ribs on one side thereof which diverge towards the rounded end, the divergent ends of the ribs being tapered to form a cutting surface.

Conveniently, there are two divergent ribs on each side of the cleat which diverge towards the rounded end and are tapered to form cutting surfaces.

An embodiment of the press and preferred cleat, according to the invention will now be described by way of example only with reference to the accompanying drawings, in which:

Fig. 1 is a side elevation of a press for inserting cleats;

Fig. 2 is a plan view of the press shown in Fig. 1;

Fig. 3 is an end view of the press looking in the direction of arrow "A" in Fig. 1; and

Fig. 4 is a plan view of a two clamping head cleat press;

Fig. 5 is a side elevation of the cleat press shown in Fig. 4;

Fig. 6 is a diagrammatic plan view of a four clamping head press;

Fig. 7 is a perspective view of an improved cleat.

The press for inserting cleats illustrated in Figs. 1 to 3 comprises a supporting frame 1 on which is mounted, at one end, two pneumatically operated clamping members 2 positioned over two locating jigs 3 to receive two wooden window sections 4 and 5 having mitred ends. The mitred ends are each preformed with arcuate parallel slots 6 and 7.

The mitred ends of the window sections are laid in an abutting position in the jigs 3 and the pneumatically operated clamping members 2 are actuated to clamp the window sections into a right-angled corner joint.

Cleats 8 are fed from a magazine (not shown) or positioned manually by the operator at the front of a cleat inserting tool 9 connected by a yoke 10 with a pneumatically operated piston ram 11 to reciprocate the tool in the directions of the arrows 'B'. The forward stroke of the tool inserts the cleats into the preformed slots 6 and 7 and presses them into the window frame sections 4 and 5 to form a rigid and robust corner joint. The return stroke of the tool removes the cleat inserting members to their rearmost position ready to receive further cleats.

The clamping and cleat inserting tool is automatically operated from an air supply under the control of the machine operator so that immediately the cleats have been inserted in the window sections to form the joint the clamping members 2 are automatically released allowing the jointed window sections to be removed from the jigs 3. The press has the required safety devices to prevent operation of the cleat inserting tool until the window sections are located in the jigs and clamped in position.

Fig. 4 illustrates a second embodiment of the cleat press having two clamping heads 21 and 23. The left hand head 21 is fixed to one end of a rail 22 while a movable head 23 is located at the right hand end of the rail. Each press head is constructed in the same manner as the embodiment described in Figs. 1 to 3, only the clamping members 24 and jigs 25 of which are shown.

In operation three mitred window sections shown in chain-dotted line are located in position in the jigs 25 and are clamped by the members 24. The movable head 23 is linked pneumatically with

the fixed head 21 and can be operated to move the movable head 23 towards the fixed head, depending upon the length of the window section 26. The movable head 23 is clamped to the rail 22 and a cleat or pair of cleats are inserted in the preferred slots in the window sections.

In a still further embodiment the press for inserting cleats may comprise four heads, as illustrated in Fig. 6. Each head is constructed and operated in a similar way to that described in Figs. 1 to 3.

The four heads 26, 27, 28 and 29 are mounted on rails 30, 31, 32 and 33 respectively. The two heads 22 and 23 are mounted to move along rail 31 while the heads 21 and 24 can move along the rail 33. Both rails 33 and 31 can then move along rails 30 and 32 providing a complete adjustment of the clamping heads to the relative length of the window sections.

All the four heads are connected by a pneumatic system so that they can be operated individually or simultaneously to suit particular requirements.

To facilitate the mass production of the frameworks, the press can be automatically controlled by a computer programme. This would include computer controlled mechanisms to cut and mitre the length of window sections to the required length, the positioning of the cut window sections in the jigs and the clamping of them in position, and the operation of the feeding of the cleats from the magazines and insertion into the window sections to form the framework.

It will be appreciated that the two and four headed clamping presses can only join together mitred window sections which are pre-machined to form a 90° corner joint.

Although the various embodiments of the press have been described as being pneumatically operated, it is to be understood that the pneumatically operated mechanism can be replaced by hydraulically operated mechanisms.

The improved cleat shown in Fig. 7 is preferably made of a flat plate of metal but may be made of a rigid plastics material. The cleat has curved nose portions (12) at one end joined by a flat end face 13. Each side of the cleat has two grooves 14 with parallel inner walls 15 and diverging outer walls 16 formed in the side surfaces of the cleat. Along the outer walls 16 are ribs 17 and 18 with angled ends 19 and 20. The end of the cleat opposite to the round nose portions 12 is cut to a V-shape to correspond to the angled shape of the mitred window sections 4 and 5.

In use each of the window sections 4 and 5 are cut to an angle to form a mitred joint with two preformed grooves 6 and 7, the groove ends are placed together to form two parallel slots into which

the cleats are pressed. The diverging ribs 17 and 18 form grooves in the wooden window sections and displace wood in their path, into the grooves 14. The curved nose portion 12 abuts against the curved ends of the grooves 6 and 7 aligning the V-shaped ends of the cleats with the angled inner walls of the mitred window sections 4 and 5. The diverging ribs 17 and 18 on the sides of the cleat engage the window sections pulling them together to produce a very strong secure joint.

Claims

1. A press for inserting a cleat (8) into a joint of a framework characterised in that it comprises a head having releasable clamping means (2) to hold at least two framework sections (4, 5) in a jointing position, a power operated cleat insertion tool (9) for receiving the or each cleat (8) to be inserted into a preformed slot in the framework joint (4, 5), the cleat insertion tool (9) being movable between an insertion position and a retracted position by a power operating means (11).

2. A press as claimed in Claim 1, characterised in that the power operating means (11) is a pneumatically operated piston and cylinder assembly (10, 11).

3. A press as claimed in Claim 1 or 2, characterised in that the cleats (8) are fed to the press in pairs from a magazine.

4. A press as claimed in any preceding claim, characterised in that the power operating means (11) can be automatically operated.

5. A press as claimed in Claim 1 or 3, characterised in that the power operating means (11) can be manually operated.

6. A press as claimed in any preceding claim, characterised in that the press includes safety devices to prevent operation of the cleat inserting tool (9) unless framework sections (4, 5) are clamped in position prior to insertion of the or each cleat (8).

7. A press as claimed in any preceding claim, characterised in that it has two heads (21, 23) mounted on a rail (22) one head (21) being fixed to the rail (22) and the other head (23) being movable relative to the fixed head (21) along the rail.

8. A press as claimed in Claim 7, characterised in that the press has four heads (21 to 27) mounted on four rails (30 to 33) each head being adjustable relative to the three other heads.

9. A press as claimed in Claim 7 or Claim 8, characterised in that the heads (27 to 29) are connected to operate by a pneumatic system and can be operated individually or simultaneously.

10. A press as claimed in any of Claims 1, 4 and 6 to 8 (when dependent on Claims 1 and 4) characterised in that the press is hydraulically operated.

11. A press as claimed in any preceding claim,

characterised in that the cutting, aligning, positioning, clamping and fixing of the joint of the framework is automatically controlled by a computer programme.

12. A cleat (8) characterised in that it comprises a flat plate rounded at one end (12), 5

two grooves (14) extending along the longitudinal axis of the cleat and at least two ribs (17, 18) on one side thereof which diverge towards the rounded end, the divergent ends of the ribs being tapered to form a cutting surface (19, 20). 10

13. A cleat as claimed in Claim 12, characterised in that there are two divergent ribs (17, 18) on each side of the cleat (8) which diverge towards the rounded end (12) and are tapered to form cutting surfaces (19, 20). 15

14. A cleat (8) as claimed in Claim 12 or 13, characterised in that each side of the cleat has two grooves (14) extending along the longitudinal axis of the cleat (8), the inner walls (15) of each groove being parallel to each other. 20

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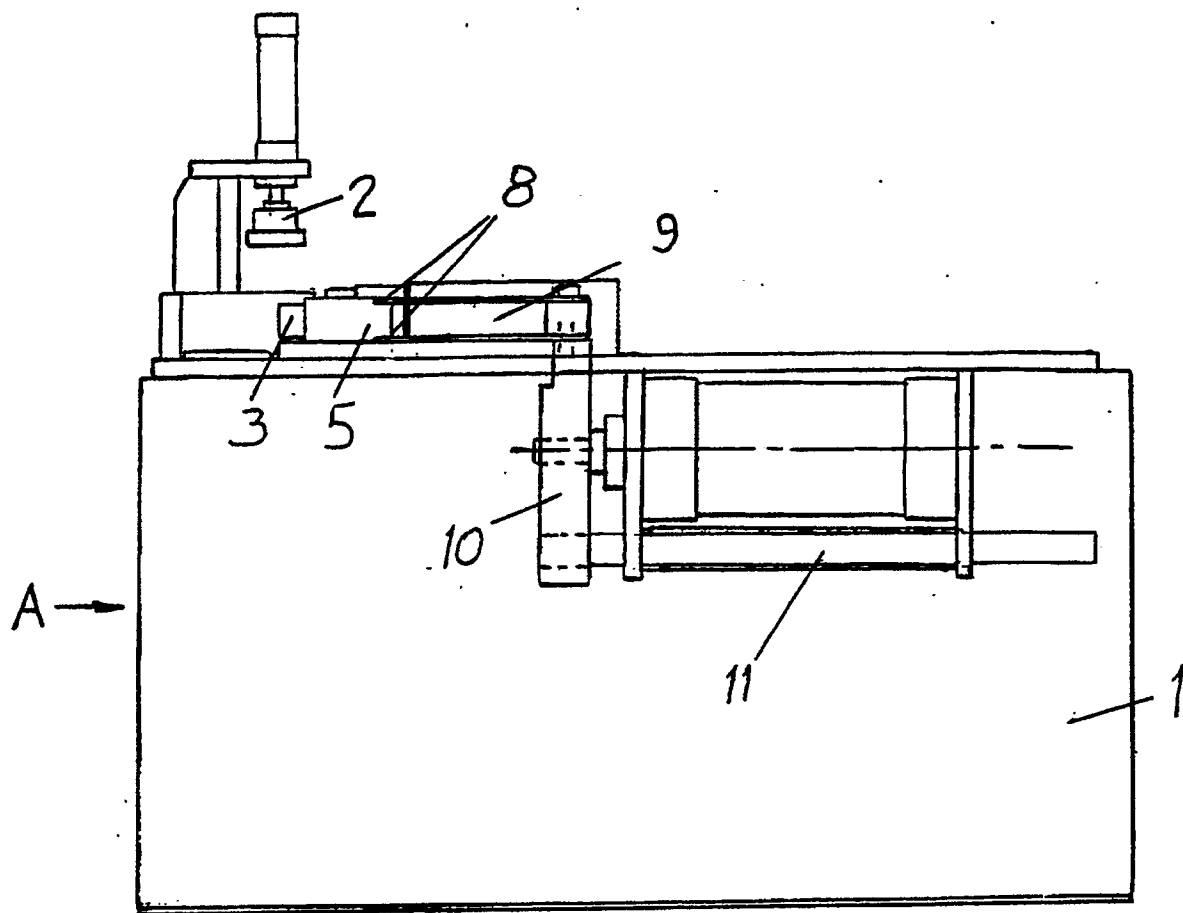


FIG. 1.

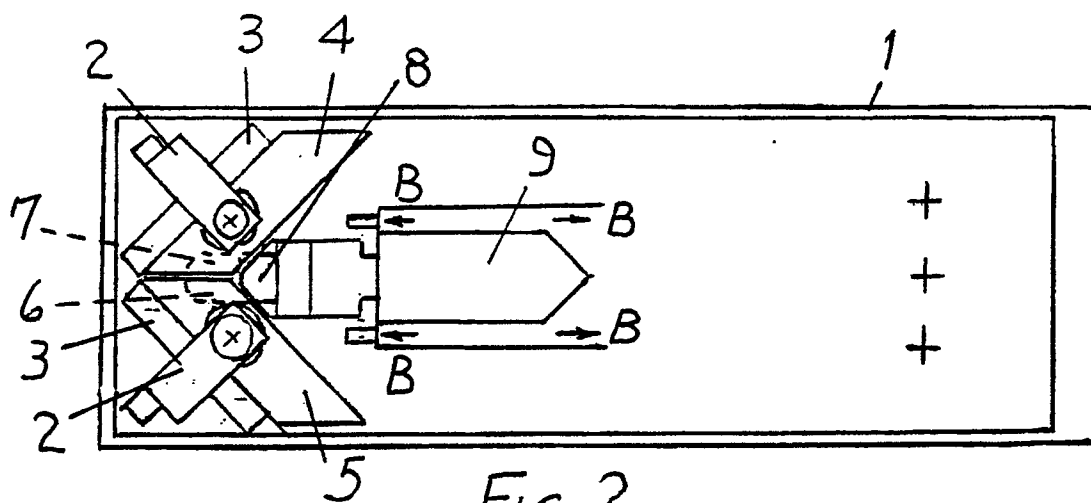


FIG. 2.

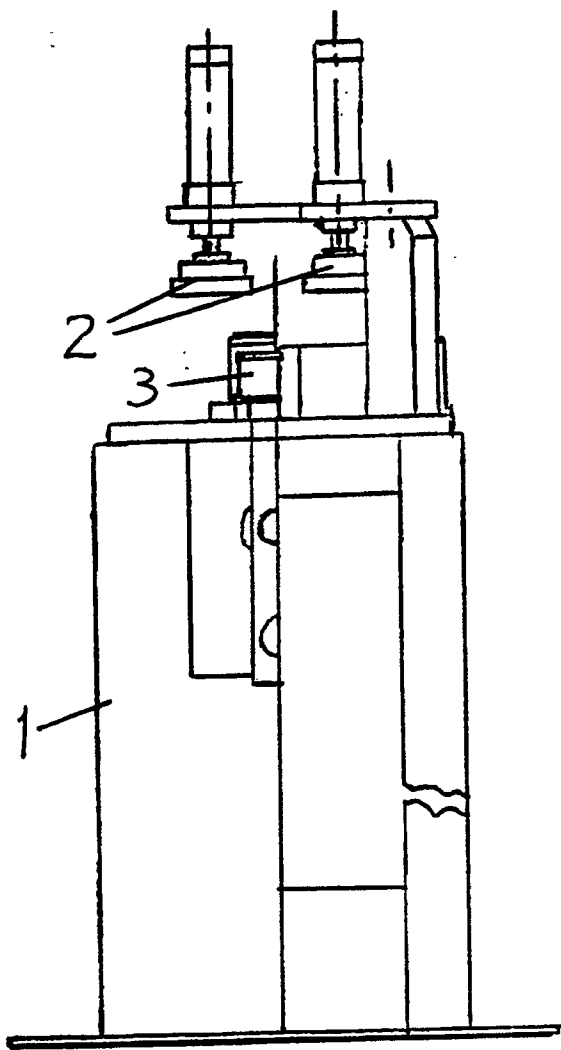


FIG. 3.

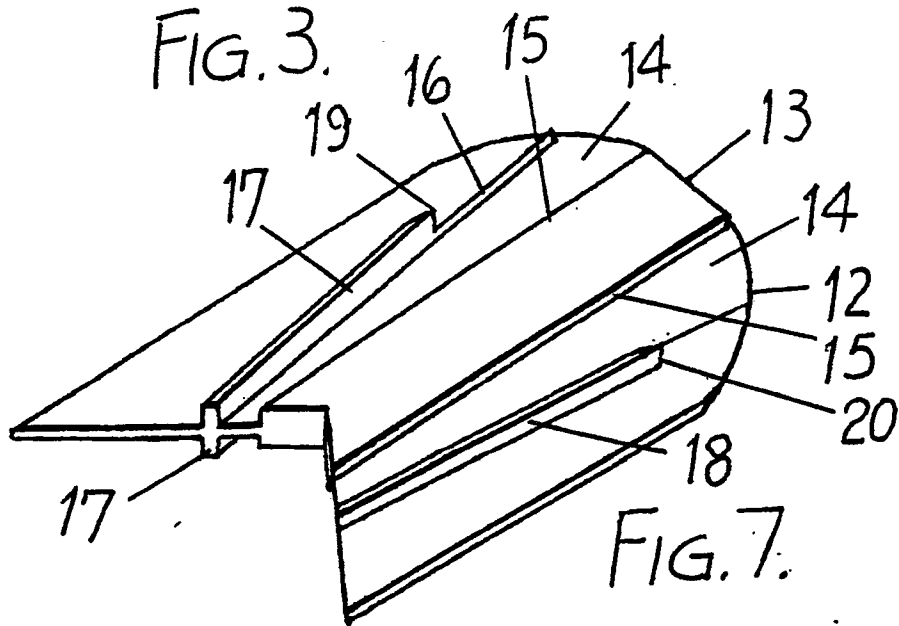


FIG. 7.

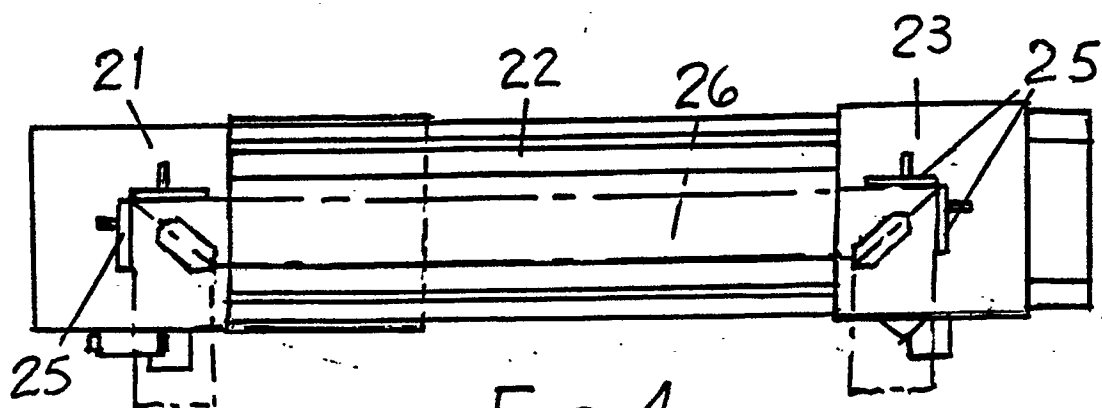


FIG. 4.

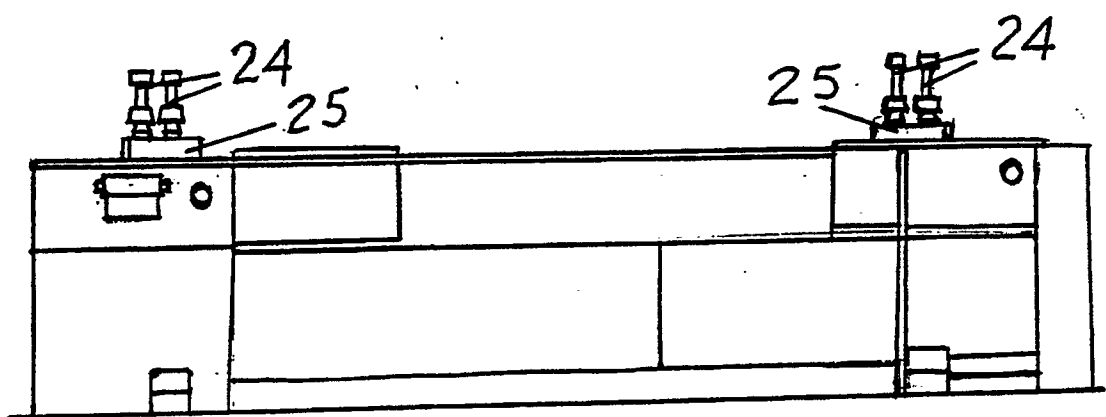


FIG. 5.

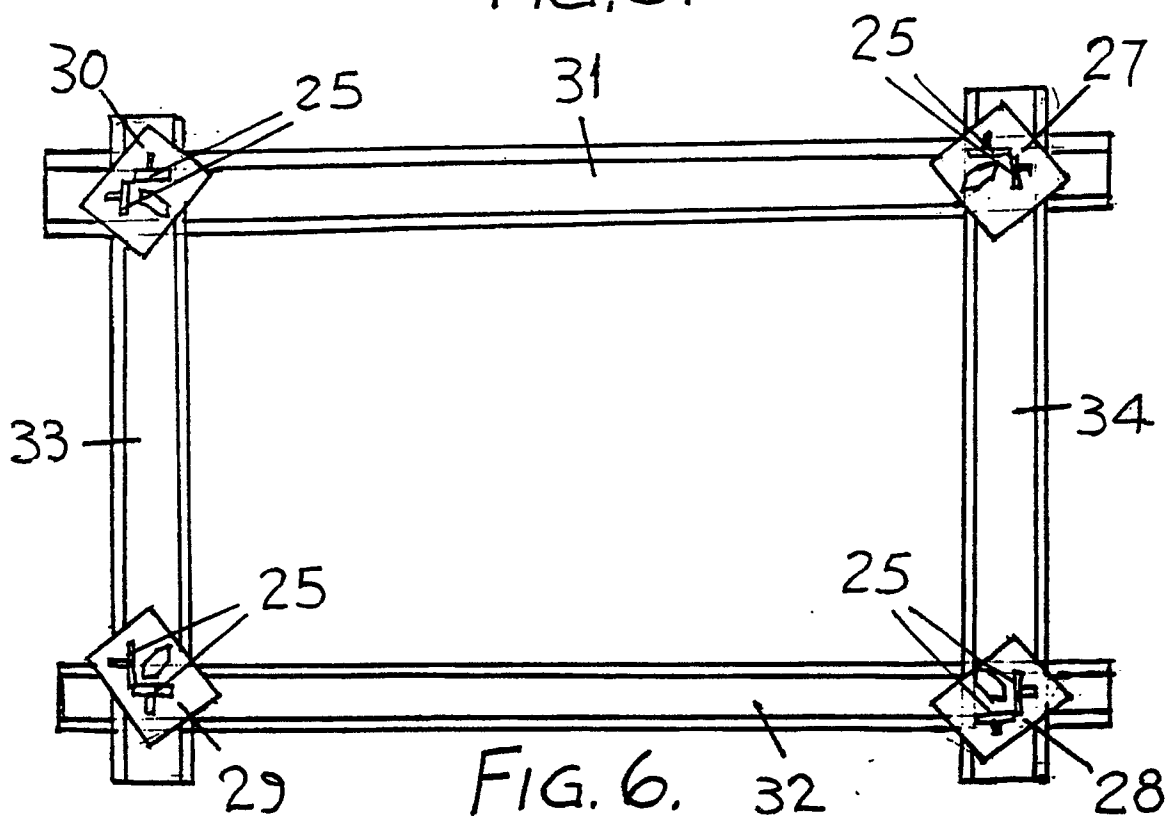


FIG. 6.



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EUROPEAN SEARCH REPORT

Application Number

EP 89 31 2643

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.5)
X	US-A-4 127 226 (JASPER) * Column 2, lines 40-55; column 6, lines 57-61; column 7, lines 9-13; claim 1; figures 1-3,8-10 *	1,2,4-6 ,10,11	B 27 F 7/02 B 25 B 5/14 F 16 B 3/00
Y	---	3,7-9	
X	US-A-3 734 381 (BLEVIO) * Figures 1,2,6,12,15; column 4, lines 21-26 *	1,2,5	
Y	---	3,7-9	
Y	FR-A-2 170 020 (MOTTA) * Figure 4; page 3, lines 2-6 *	3	
Y	US-A-4 828 239 (GRANDY et al.) * Claim 1; figure 1 *	7-9	
Y	DE-B-1 061 056 (F. HOMBURG KG) * Figure 1 *	7-9	
Y	DE-A-3 534 259 (KACHEL) * Figure 1 *	7	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
Y	US-A-2 182 154 (LANCASTER) * Figure 2 *	7	B 27 F B 25 B
A	US-A-3 597 142 (JASPER) * Figures 9-11 *	1,2,5	
A	US-A-4 572 420 (PISTORIUS) * Figure 4 *	1,3,5	
A	WO-A-8 200 323 (SENCO SOUTHEAST IND.) * Figures 4-6 *	1	
	---	-/-	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18-07-1990	Examiner CARMICHAEL D.G.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid,
namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

X LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions,
namely:

1. Claims 1-11: Press for inserting a cleat into a joint of a framework.
2. Claims 12-14: A cleat for connecting any two pieces.

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid,
namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims,
namely claims: 1-11



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.5)
A	FR-A-2 318 715 (CASSESE) ---		
A	FR-A-2 609 925 (BUCAILLE) ---		
A	DE-C- 55 415 (LÖBBE) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 18-07-1990	Examiner CARMICHAEL D.G.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			