



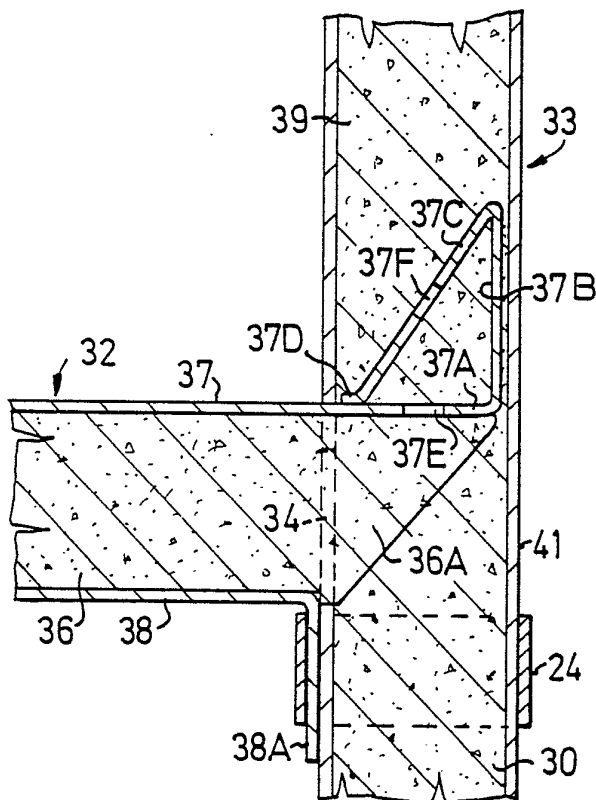
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: JOINT BETWEEN TWO TUBES OF SQUARE OR RECTANGULAR CROSS-SECTION

(57) Abstract

In a joint between a first and a second rectangular tube (32, 33), the first tube (32) has its end provided with anchoring means and inserted through an insertion opening (34) in the front wall (40) of the second tube (33). The anchoring means located within the second tube are embedded in the concrete filling the two tubes. According to the invention, the anchoring means consist i.a. of two wings (36A) which form extensions of the side walls of the second tube, and a tongue (37B) which forms an extension at the end of an intermediate wall (37A), constituting an extension of one transverse wall (37) of the second tube. This anchoring tongue (37B) lies along the rear wall (41) of the second tube.



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Joint between two tubes of square or rectangular cross-section

The present invention relates to a joint of the type described in the preamble of the following main claim. An example of such a joint is described in Swedish Lay-Open Print 8301953-9.

5 In the known joint, separate anchoring means are used, which can be fixed to one of the tubes and inserted through an insertion opening in the other tube to be embedded when the two tubes are filled with concrete, particularly expanding concrete.

10 The object of the present invention is to make possible a simplified and thus cheaper manufacture of a tube provided with such anchoring means. This is achieved by a joint which in accordance with the invention has the characterizing features defined in
15 the following main claim.

In manufacturing the first tube, which is to be provided with the anchoring means, this can be done simply by laser cutting and subsequent bending of the parts thus freed to positions disclosed in the
20 characterizing clause of the main claim. Usually the first tube is substantially narrower than the second tube, but within the scope of the invention it is also possible to make a joint between two tubes of essentially the same width. The tubes can form various
25 desired angles to each other within the scope of the invention.

Two simple embodiments of the joint according to the invention are shown as examples in the accompanying drawings.

30 Fig 1 shows a first embodiment of a joint according to the invention in section along the line 1-1 in Fig 2.

Fig 2 is a section along the line 2-2 in Fig 1.

Fig 3 is a perspective view of one end of the first tube with the anchoring means.

Fig 4 shows the cutting and bending of the parts of the tube end to form anchoring means.

5 Fig 5 shows the first tube of a second embodiment of the invention in a perspective view.

Fig 6 shows in section this first tube mounted in the second tube.

10 Fig 1 shows a horizontal first tube 10 of rectangular cross-section, comprising two side walls 11,12 and two transverse walls 13,14 between the edges of the side walls.

15 A second rectangular tube 10A has two side walls 15,16, a front wall 17 and a rear wall 18. The front wall is provided with a rectangular insertion opening 19 with lateral edges 20,21 and transverse edges 22,23.

20 In the example shown, the joint is made so that the first tube 10 fits relatively snugly into the opening 19. Any play can be taken up by seals (not shown).

25 In the inserted position shown in Fig 1, the first tube 10 has two anchoring wings 11A,12A which are extensions of the side walls 11,12 and extend up to the vicinity of the rear wall 18.

30 The transverse walls 13,14 of the pipe extend up to the opening 19, and there the transverse wall 13 continues at the opening with a tongue 13A which lies against the front wall 17 of the tube 10A and is fixed in this position by means of a ring 24 around the tube 10A and over the tongue 24 to hold the tubes 10,10A in position when concrete is cast into the two tubes.

35 The second transverse wall 14 continues with an intermediate wall 14A which is bent in the vicinity of the rear wall 18 and extends with an anchoring tongue 14B along the rear wall 18.

In the intermediate wall 14A there is a flow-through opening 25, through which concrete can flow when the two pipes are filled with concrete, thus embedding the anchoring means 11A,12A,14A,14B in cast concrete.

As is indicated in Figs 1 and 3, the intermediate wall 14A can be separated from the wings 11A,12A by means of slits 26, these being necessary if the wings 11A,12A are to be closer to each other than the width between the walls 11,12. The tongues 13A,14B and the intermediate wall 14A should have a corresponding smaller width, which is the case if the tube 10 has the same width as the tube 10A. The two tubes 10,10A can be identical. The opening 19 then takes up the entire internal width between the side walls 15,16 of the tube 10A.

Fig 4 shows how it is possible in a simple manner to achieve the tube end shown in Fig 3 using a tube 10 of rectangular cross-section. Slits 27,28 are made in the side walls, e.g. using a laser. The slit 28 can be extended to form the slit 26. The transverse wall 13 is then cut at 29, and the tongue 13A is bent up. The side walls 11,12 are cut at 29A to leave the wings 11A,12A. The hole 25 has been made in the intermediate wall 14A. The tongue 14B is then bent downwards to the position for use.

In the example shown, the tube 10 forms a right angle with the tube 10A, but this angle can be selected as needed within the scope of the invention. The tongues 13A,14A will then have correspondingly changed angles relative to the tube 10. The wings 11A,12A can also have other shapes than those shown.

In Fig 1, the two tubes are filled with expanding concrete 30, in a manner known per se.

The second embodiment of the joint of the invention is shown in Figs 5 and 6. A first tube 32

has its end connected to a second tube 33, both tubes being of rectangular cross-section as in the embodiment shown in Figs 1 and 2.

5 The tube 33 has an insertion opening 34 for receiving the anchoring end of tube 32 so that it can be secured by being embedded in the concrete injected.

The tube 32 has two side walls 35,36 and two transverse walls 37,38.

10 The tube 33 has two side walls 39, a front wall 40 and a rear wall 41.

At their ends the side walls 35,36 are extended with substantially triangular anchoring wings 35A,36A which have their narrow ends positioned adjacent to the rear wall 41.

15 The transverse walls 38,39 of the tube 32 extend to the opening 34, the transverse wall 30 being extended with a tongue 38A lying against the outer side of the front wall 40 and held in place by means of the ring 24.

20 The second transverse wall 37 is extended with an intermediate wall 37A positioned between the upper edges of the anchoring wings 35A,36A. At its end this wall is extended with a tongue 37B which is bent at an angle to the intermediate wall 37A and positioned
25 along the wall 41.

At its end the tongue 37B is extended into a support wall 37C. This wall has an oblique position and extends to transverse wall 37 where it is provided with a foot 37D abutting the wall 40 above the upper
30 edge of the opening 34.

In the intermediate wall 37A there is a flow-throw opening 37E, and in the support wall 37C there is an opening 37F, both openings being intended to facilitate distribution of the injected concrete to
35 the spaces around the end of the tube 32 located in the tube 33.

The support wall 37C will reinforce the tongue 37B so that it will assist in maintaining the tube 37 in its predetermined position relative to the tube 33. The foot 37D or the lower end of the support wall 37F rests against the front wall 40 and cooperates with the ring 24 securing the tongue 34A to prevent the end of the tube 32 to leave its predetermined position in the tube 33 when injecting concrete in the two tubes under relatively high pressure.

CLAIMS

1. Joint between two tubes (10,10A;32,33) with square or rectangular cross-section, the first one of said tubes (10;32) having its end inserted through an insertion opening (19;34) in the front wall (17;40) of the second tube (10A) and being provided with at least one anchoring means (14B;37B) lying within the interior of the second tube and extending in its longitudinal direction along the rear wall (18;41) of the second tube, both of said tubes being filled with concrete, preferably expanding concrete (30), characterized in that the first tube (10;32) is formed at its end so that its two side walls (11,12;35,36) are extended to form two anchoring wings (11A,12A;35A,36A), that the transverse walls (13,14;37,38) of the first tube extending between the longitudinal edges of the side walls (11,12;35,36) end up at the opening (19), where one transverse wall (13;38) merges into a tongue (13A;38A) which lies along the outside of the front wall (17;40) of the second tube, while the other transverse wall (14;37) is extended with an intermediate wall (14A;37E) up to the vicinity of the rear wall (18;41) of the second tube and is there extended with an anchoring tongue (14B;37B) which extends along said rear wall (18;41), and that the intermediate wall (14A;37E) between the anchoring wings (11A,12A;35A,36A) is provided with a flow-through hole (25;37E) for concrete which flows through said hole during filling of the two tubes with concrete.

2. Joint according to Claim 1, characterized in that the two tubes form a right angle to each other.

3. Joint according to Claim 1, characterized in that the two tubes form an angle to each other which substantially deviates from a right angle.

4. Joint according to anyone of the preceding claims, characterized in that the two anchoring wings are essentially parallel.

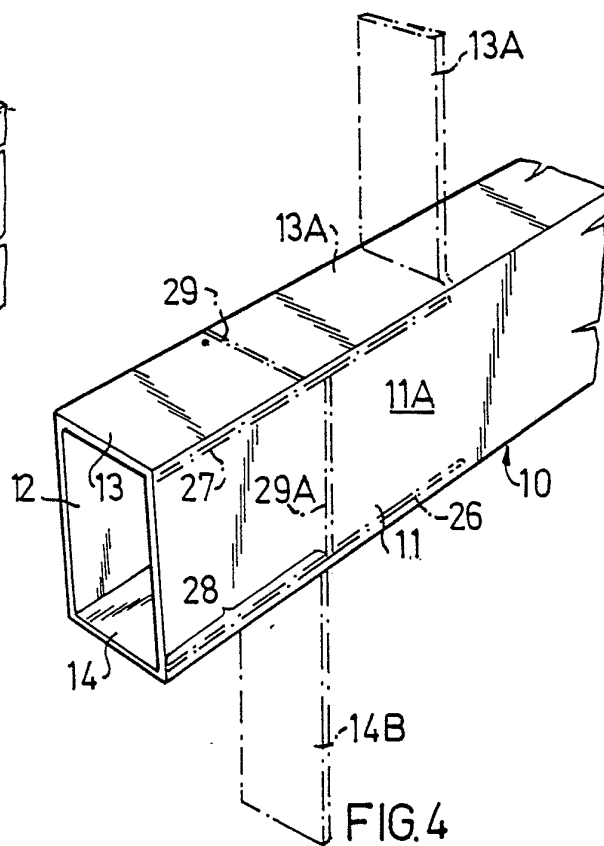
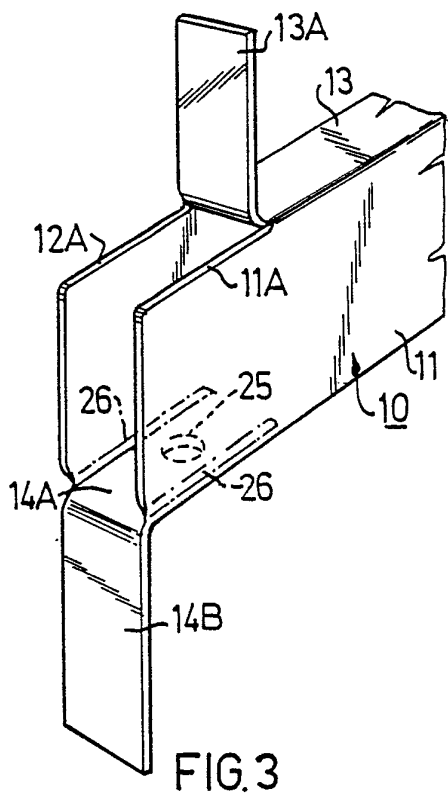
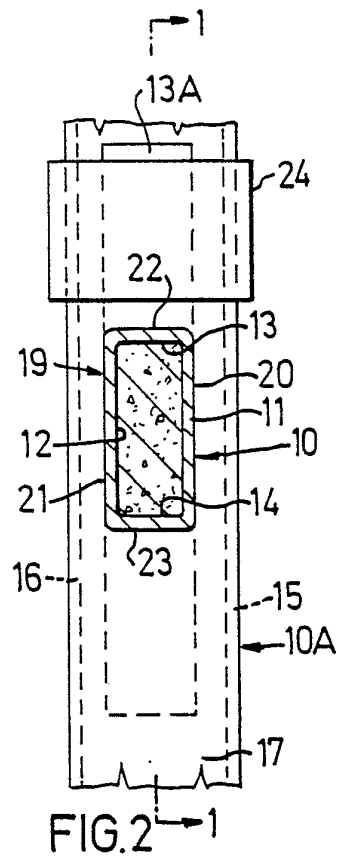
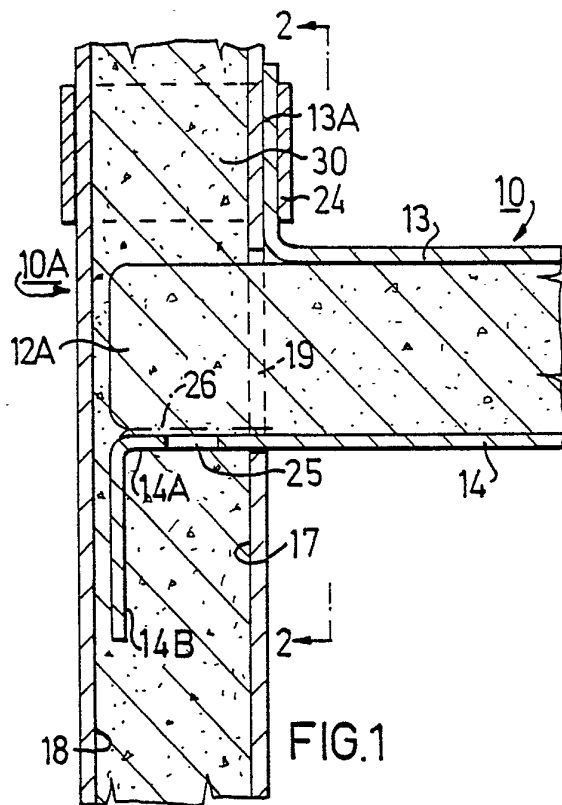
5. Joint according to anyone of Claims 1-3, characterized in that the two anchoring wings are bent toward each other.

6. Joint according to anyone of the preceding claims, characterized in that the intermediate wall (14A) between the anchoring wings is solidly joined to the adjacent edges of the wings and is made in one piece therewith.

7. Joint according to anyone of Claims 1-5, characterized in that the intermediate wall (14A) between the anchoring wings is separated from the wings by means of slits (26).

8. Joint according to anyone of the preceding claims, characterized in that the tongue (37B) forming an extension of the intermediate wall (37A) is at its end extended with a support wall (37C) which extends between the end of the tongue and obliquely to the intermediate wall (37A) adjacent the insertion opening (34) in the front wall (40) of the second tube.

9. Joint according to Claim 8, characterized in that the support wall (37C) is at its free end shaped with a foot (37D) or the like resting against the front wall (40) above the upper edge of the insertion opening.

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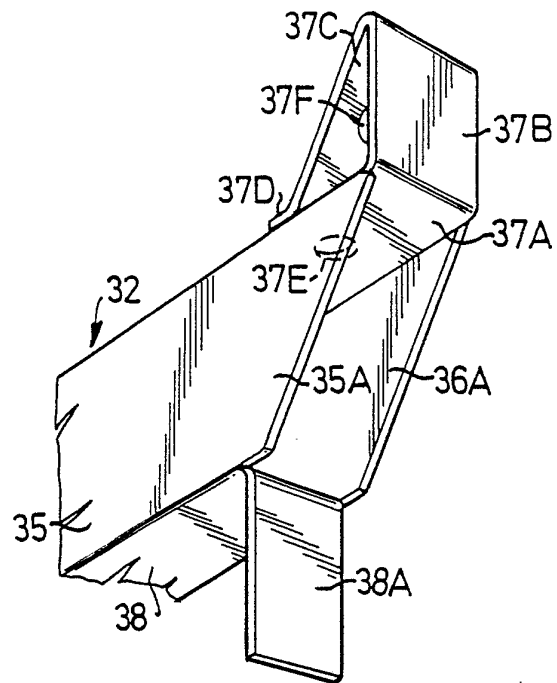


FIG.5

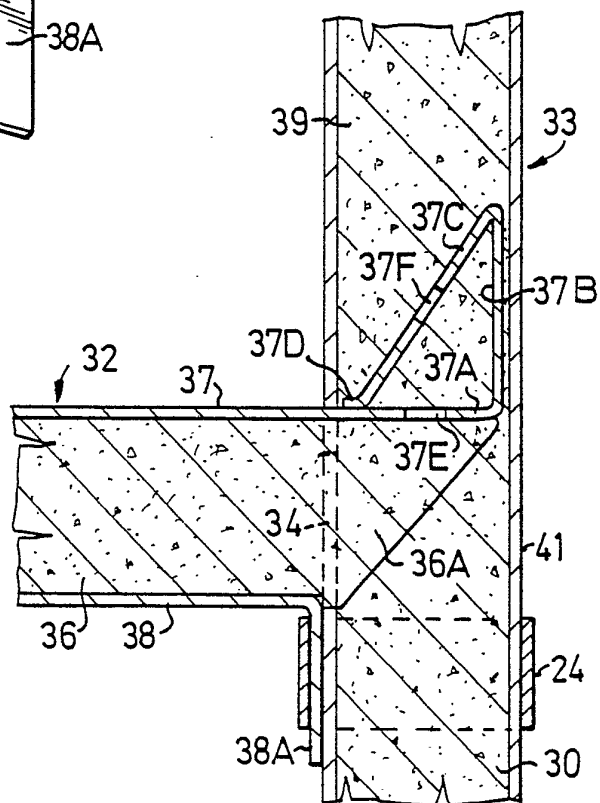


FIG.6

INTERNATIONAL SEARCH REPORT

International Application No PCT/SE86/00433

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC 4		
E 04 B 1/38		
II. FIELDS SEARCHED		
Minimum Documentation Searched 7		
Classification System	Classification Symbols	
IPC 4	E 02 D 27/48; E 04 B 1/00, /14, /19-/21, /30, /34, /348, /38 5/02, /10, /16-/25; E 04 C 3/04, /293, /294; E 04 F 11/02; E 04 G 5/04, 7/22, /30, 23/00-/06	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched 8		
SE, NO, DK, FI classes as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT 9		
Category 9	Citation of Document, 11 with indication, where appropriate, of the relevant passages 12	Relevant to Claim No. 13
A	DE, A1, 3 003 446 (KRAUS RAINER) 6 August 1981	
A	DK, B, 130 335 (HAGELIN ERIK GUSTAV) 10 February 1975	
A	WO, A1, 80/00356 (ANDERSSON LEIF) 6 March 1980	
A	WO, A1, 81/04124 (DAHLEN GUSTAV LENNART) 25 October 1984	
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IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
1986-12-03	1986-12-12	
International Searching Authority	Signature of Authorized Officer	
Swedish Patent Office	Ingemar Hedlund	

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

II Fields searched (cont)

US C1 52: 73, 79, 127, 221, 378, 506-514,
698-714

V. ☐ **OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE ¹**

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers....., because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim numbers....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claim numbers....., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ **OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING ²**

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.
2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- ☐ The additional search fees were accompanied by applicant's protest.
☐ No protest accompanied the payment of additional search fees.