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54 **A method of joining and sealing elements in building structures and a connector for coupling elements of building structures.**

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The method according to the invention is based on squeezing tubular feet (5) of the coupling connector until an oval shape is obtained, which enables insertion of the connector into shaped edges of building elements. Next, e.g. by heating, the feet (5) are returned to a shape similar to the initial one, causing an effective closure of the connection.

The coupling connector in accordance with the invention consists of arms (1) inclined at an acute angle and united at their ends (2). Each arm (1) possesses a straight section (3) and a bent section (4) equipped with a tubular clamping foot (5). The coupling connector may also possess arms forming in the cross-section the shape of a trapezoid or oval, on the transverse axis of which the feet are mounted.

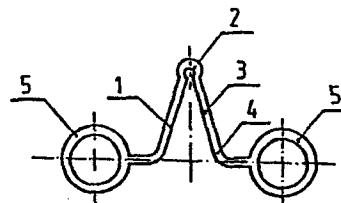


FIG. 1

A method of joining and sealing elements in building structures and a connector for coupling elements of building structures.

This invention deals with a method for joining and sealing prefabricated elements of building structures and with a coupling for sealing joints, e.g. vertical joints, in walls of prefabricated elements with concrete, wooden or metal edges equipped with shaped
05 recesses.

Known connectors for joining building elements are made as inserts, e.g. spring-back strip, made of a
10 flexible plastic slipped into the recess of the prefabricated building element, with the flexibility of the coupling material being taken advantage of during assembly with the arms of the deformable plastics material being slipped into the recess shape by pressing in, thus sealing the joint.
15

From DE-A 2328819 and DE-A-2429003 coupling connectors are known in the form of a "V" cross-section strip - with the arms possessing a cross branching. This
20 method is significant in that, during assembly, arms of the coupling are pressed towards one another and slipped into the recess of the building element. After assembly, due to the flexibility of the coupling, the plastics arms of the coupling together with the
25 branching press against walls of the recess, thus

sealing the joint.

From DE-A-2156248, DE-A-2237708 and DE-A-2938366,
05 connectors are also known made of a flexible plastics
in the form of a shaped strip, possessing arms of
variable cross-section. This method is significant in
that the connectors are assembled by pressing into re-
cesses in building elements.

10 The existing methods of assembly lead to damaging of
the external surfaces of the arms and branches of the
connector due to friction against the unevenness of the
surface of building element recesses. Also, the connec-
15 tors must be manufactured of a flexible and plasticized
polymer which undergoes a rapid aging process leading
to loss of connector flexibility and cracking, i.e.
to the loss of joint tightness.

20 Also, the known connectors must be used only with the
elements possessing recesses shaped in accordance
with the shape of the connector arms.

It is an object of this invention to develop a method
for connecting and sealing elements of building struc-
25 tures and a construction of a coupling connector which
makes possible manufacturing of the connector of a
stable polymer with lower flexibility ensuring higher
strength and tightness of the joint.

30 The method of connecting in accordance with the in-
vention is characterized in that the foot of the
coupling connector made in the shape of a tube is squeezed
before assembly to receive an oval shape enabling easy
inserting of the connector into the recess in the
35 building element. The connector is next, subjected to

deformation, e.g. by heating, thus returning the shape of the connector foot substantially to its initial state, and efficiently closing the connection in this manner.

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The coupling connector according to the invention may be manufactured as a shaped strip. It possesses two spaced, acutely angled arms permanently connected at their ends, each arm consisting of a straight section and a bent
10 section at an angle of 70° to 80° to the horizontal, with the bent section being equipped with a clamping foot made in the form of a tube.

An alternative coupling connector according to the invention possesses four arms permanently connected to
15 each other at respective ends. Preferably, one cross-section of the arms is shaped as a trapezoid or an oval, with the clamping feet made in the form of tubes being arranged on the transverse longitudinal axis on
20 legs.

The solution according to the invention enables manufacture of a coupling connector of a highly durable material, e.g. a hard PVC, and permits stable connection
25 of elements of building structures and obtaining of connection tightness independently of the shape and surface of the recess in the element.

Embodiments of the invention are exemplified in the
30 drawings in which:

Fig. 1 presents a schematic view of the coupling connector in cross-section independently working building elements;

Fig. 2 shows an alternative solution of the coupling
35 connector in cross-section;

- Fig. 3 shows the coupling connector of Fig. 1 shown in cross-section during the assembly stage;
- Fig. 4 shows the coupling connector of Fig. 3 introduced into joints of concrete building elements in cross-section;
- 05 Fig. 5 shows the coupling connector of Fig. 3 introduced into joints of building elements after deformation and return to the working phase in cross-section;
- 10 Fig. 6 shows the coupling connector of Fig. 1 introduced into the joint of building elements with wooden edges in cross-section; and
- Fig. 7 shows the coupling connector of Fig. 1 introduced into the joint of building elements with wooden edges in cross-section.
- 15

The coupling connector shown in Fig. 1 consists of two arms 1 permanently connected to one another at their top ends 2 and inclined at an acute angle.

- 20 Each arm 1 consists of a straight section 3 and at an angle 70° to 80° in relation to the straight section 3, a bent section 4. The bent section 4 is equipped with a clamping foot 5 made in the form of a tube.

25

The feet 5 of the coupling connector are squeezed before assembly, receiving an oval shape 6 of foot 5 to enable free introduction of the connector into the shaped edges of the building elements.

30

After completing assembly of the building elements the coupling connector is seated in the adjoining building elements and, next, deformation of the

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foot 5 of the connector is effected to the almost initial shape (shape memory) by supplying steam and heating up.

The foot 5 is thus flexibly fitted to the shaped edge, sealing the joint.

The connector according to the alternative solution and shown in Fig. 2 consists of four arms 7 permanently connected at their tops 8 forming in cross-section the shape of a trapezoid 10 or oval 11. In the transverse axis on legs 12 are seated the feet 13 made in form of tubes.

It will be appreciated that the drawings illustrate the coupling connectors in cross-section and that the connectors are in fact preferably elongate members. In particular, the feet 5, 13 may be elongate tubes which can be inserted into elongate slots or grooves in edges of two building elements or prefabricated panels for jointing and sealing purposes.

Claims:

1. A method for connecting and sealing elements of building structures by inserting a coupling connector into a recess of each element characterized in that a tubular foot of the coupling connector is squeezed to form a flattened shape, the foot is seated within
05 a shaped edge of a building element, and is re-formed, e.g. by heating, to cause the foot of the connector to tend to return to a shape substantially similar to the initial one.
- 10 2. A coupling connector for structural building elements characterized in that it has two mutually inclined arms (1) united at respective ends (2), each of the arms (1) consisting of a straight section (3) and a section (4) bent at an angle relative to
15 the straight section (3), with the bent section (4) provided at its end with a tubular clamping foot (5).
3. A coupling connector for structural building elements characterized in that it has four arms (7)
20 united at their ends (8), the arms preferably forming an oval or trapeoidal cross-section (10,11) of the connector and having lateral tubular feet (13) mounted on legs (12) extending from the arms (7).
- 25 4. A coupling connector according to claim 2, characterized in that said angle is in the range of from 70° to 80°.
5. A building structure comprising at least two
30 building elements coupled together by means of a coupling connector according to any one of claims 2 to 4.

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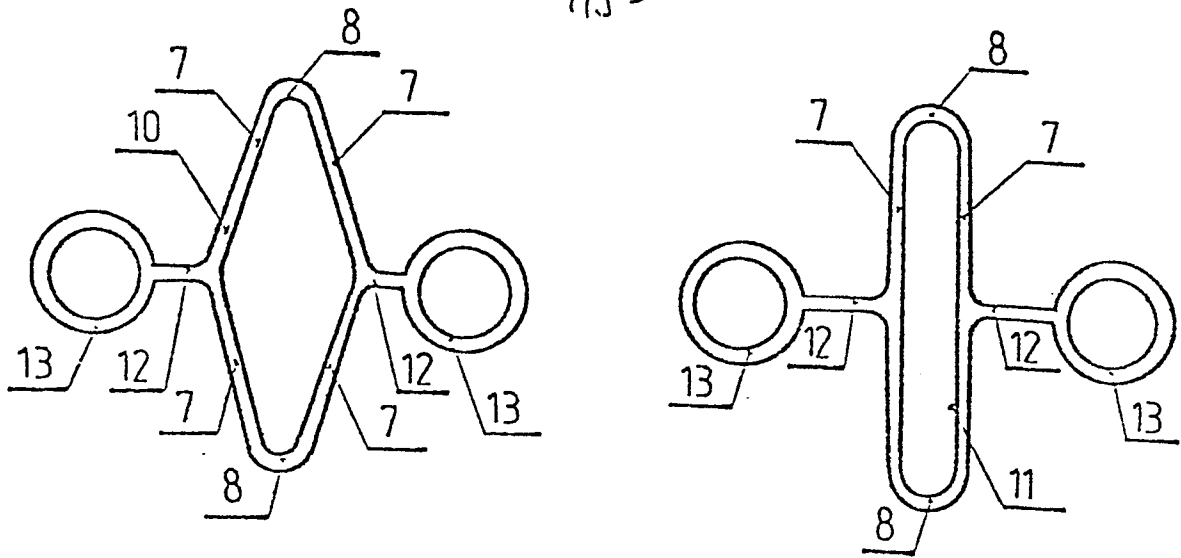


FIG. 2

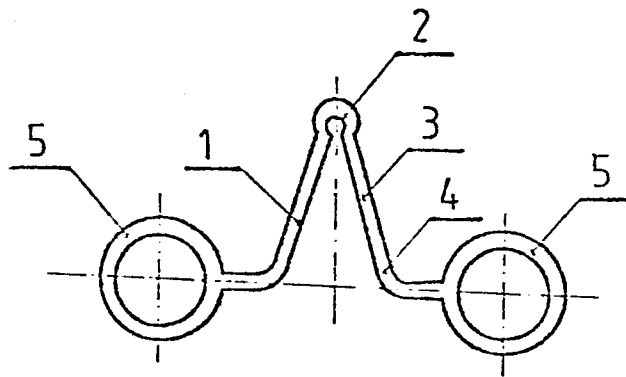


FIG. 1

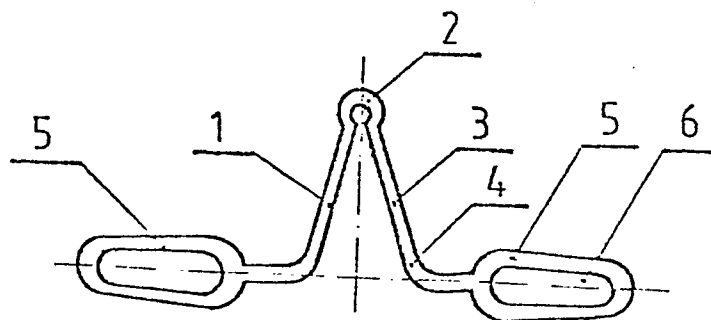


FIG. 3

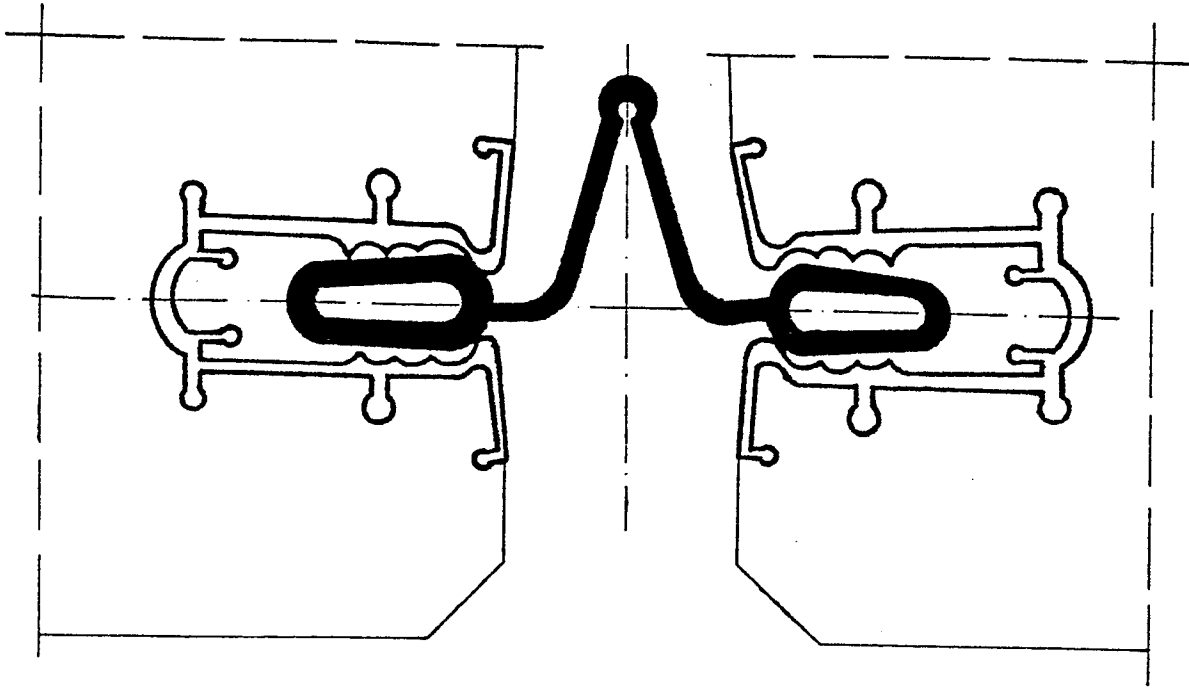


FIG. 4

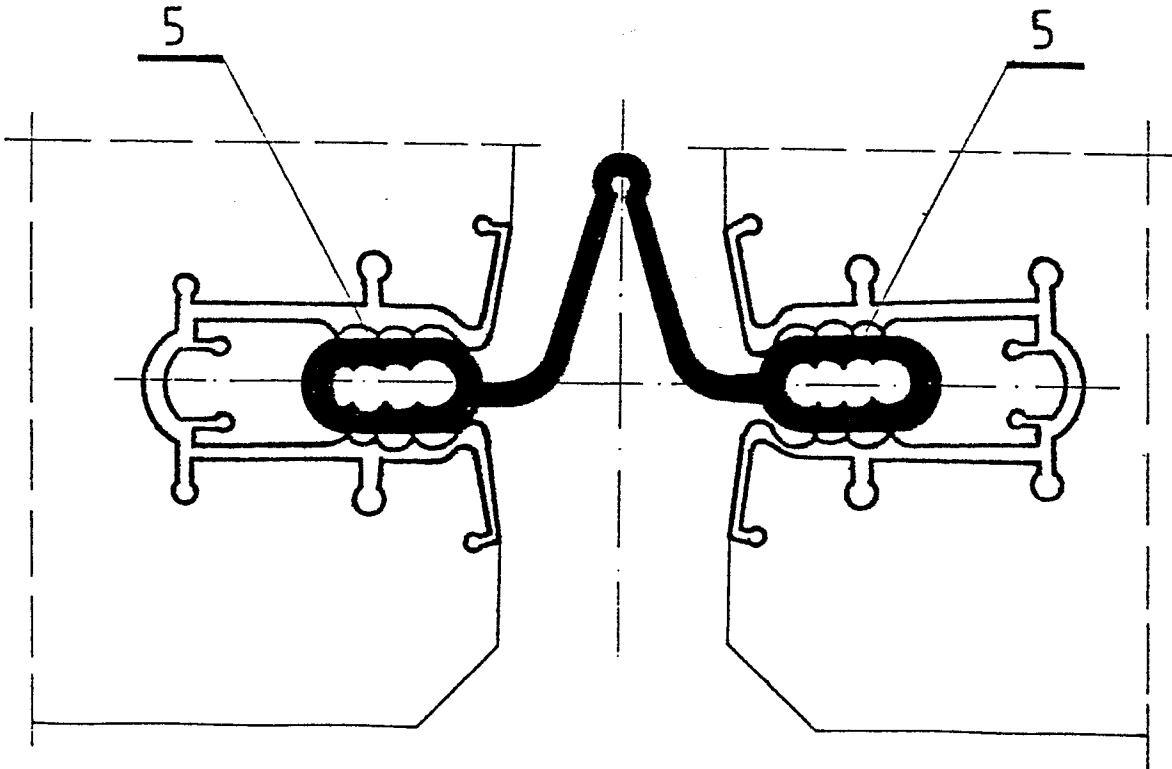


FIG. 5

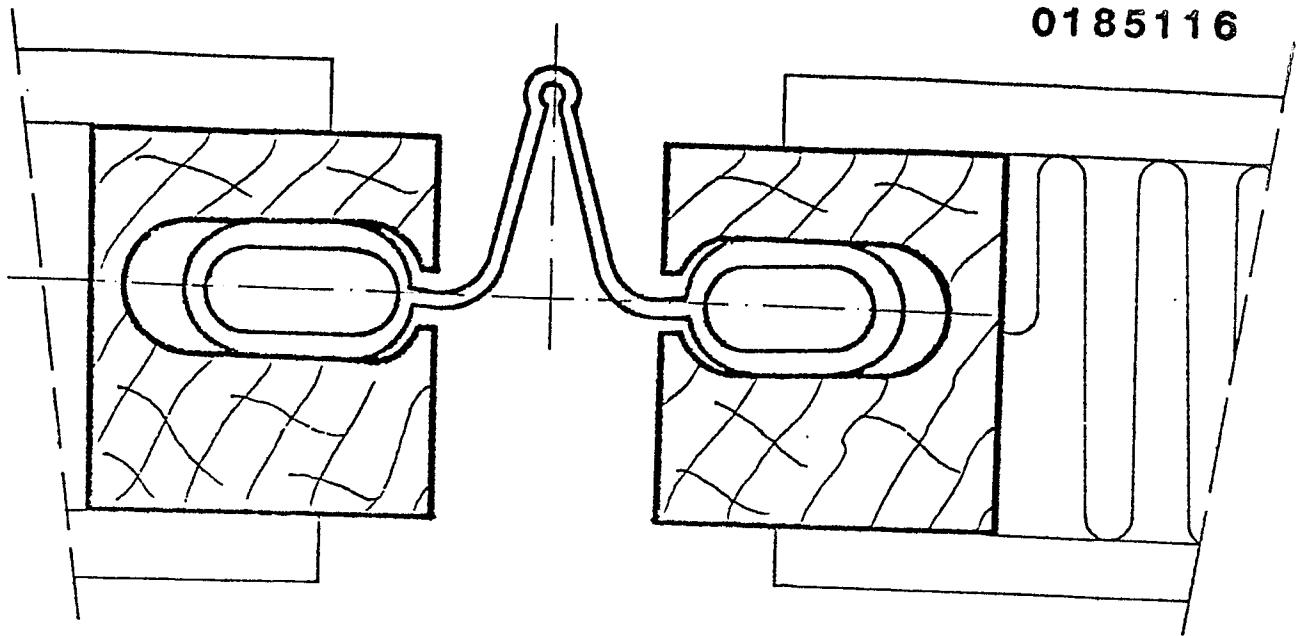


FIG. 6

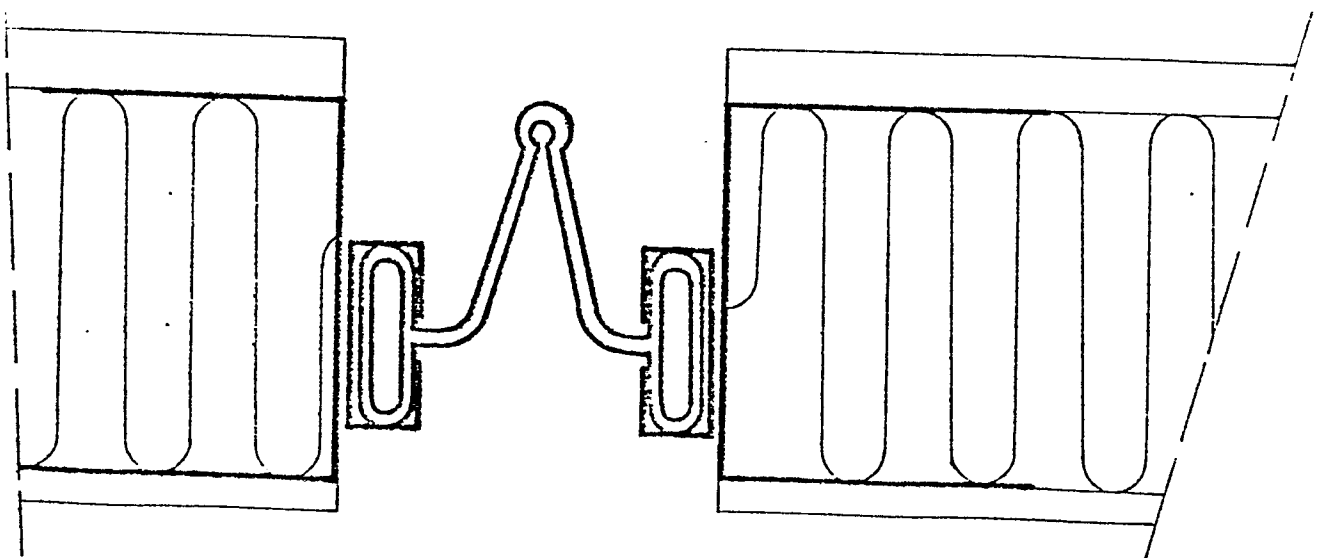


FIG. 7



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Application number

EP 84 11 6100

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)
X	CH-A- 408 362 (FORMBETON AG) * Complete document *	1	E 04 B 1/68
Y		2	
Y	DE-U-7 308 743 (KALDENBERG) * Figure *	2	
A		5	
Y	DE-A-2 747 938 (KREISS) * Page 7 *	1	
Y	DE-A-2 227 256 (HÜWA-WALTER HÜBNER HANDELSVERTRETUNG) * Page 3, last paragraph - page 9; claims *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
A	DE-A-2 058 725 (CLOUTH GUMMIWERKE AG) * Figures 3,4 *	2,3,5	E 04 B 1/00
A	DE-A-1 784 069 (CONTINENTAL GUMMI-WERKE AG et al.) * Figures 3-5 *	3,5	
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 26-07-1985	Examiner PAETZEL H-J
CATEGORY OF CITED DOCUMENTS		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	
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			



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EUROPEAN SEARCH REPORT

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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	DAS BAUZENTRUM, no. 5, 1972; "Fugendichtung, Fassaden-Imprägnierung", pages 59-70 * Page 60, right-hand column, last paragraph - page 62, para- graph 1 *		
A,D	DE-A-2 938 366 (DYCKERHOFF & WIDMANN AG) -----		
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 26-07-1985	Examiner PAETZEL H-J
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	