

PATENT SPECIFICATION

(11) 1 444 493

1 444 493

- (21) Application No. 38691/74 (22) Filed 4 Sept. 1974
 (31) Convention Application No. 2344713
 (32) Filed 5 Sept. 1973 in
 (33) Germany (DT)
 (44) Complete Specification published 28 July 1976
 (51) INT CL² A63H 33/10 F16B 21/10
 (52) Index at acceptance

A6S 6E2
 F2H 31D 31E 31F 31G GX3



(54) CONNECTION ELEMENT FOR TOYS

(71) I, ARTUR FISCHER, a German Citizen, of 7241, Tümlingen, Altheimerstrasse 219, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a connection element and connection means for securing a component of a toy building set to a foamed plastics member.

It is known to use adhesive to secure building components to foamed plastics members when, for example, attaching groups of model components to toy landscapes made of foamed plastics members. However, such a fixing method that does not permit separation of the parts precludes subsequent variation of the landscape and, in particular, the changing of the positions of the groups of model components on the landscape. This is particularly disadvantageous in the case of landscapes for structures and groups of model components that are made up of the components of a toy building set, since when use is made of a fixing method, such as adhesive bonding, that does not permit separation of the parts, neither the landscape nor the parts forming the models can be put to further use.

The present invention provides a connection element for securing a component of a toy building set to a foamed plastics member, the element comprising a first portion which can be pressed into the foamed plastics member and a second portion which, in use, lies outside the foamed plastics member and which is securable to a toy building component, the first portion being a flat elongate member which is pointed at its free end and being formed with at least one aperture through which a fixing element can be driven, wherein the second portion includes a connector of the groove-and-tenon type.

The first portion of the connecting element can be pressed into a foamed

plastics member at right-angles to a surface thereof. On account of its flat form, the first portion readily penetrates the soft and porous material and in so doing passes through the fibres of the foamed plastics member so that there is no crumbling of the material surrounding the point of penetration such as would occur for example, if the free end of the first portion was blunt. Such crumbling would result in the material losing its elasticity and decrease the compressive force that is primarily responsible for anchoring the connection element. Thus, since substantially no crumbling of the structure occurs when this connection element is used, the full elasticity and compressive force of the plastics member are retained and little destruction of the material, which could cause deformation of the surface, occurs.

Advantageously, both mouths of the or each aperture in the first portion are flared by means of inclined lead-in surfaces. This flaring of the aperture or apertures facilitates insertion of a fixing element. Thus, during insertion of a fixing element, if the fixing element is not in precise register with an aperture, the inclined lead-in surfaces cause the tip of the fixing element to be deflected and to find its way through the aperture.

The connector of the second portion enables components of a toy building set to be attached to the connection element, these components being provided with complementary connectors. Thus, a model built by a child can be detachably secured to the surface of a landscape made up from foamed plastics members, so that the model can be readily replaced by another model. By using only a few connection elements, building components and building boards can be secured to the surface of the landscape, and these in turn can be provided with a larger number of connectors for adding further components of a toy building set. Preferably, the

50

55

60

65

70

75

80

85

90

95

connector of the connection element is a re-entrant tenon.

5 Preferably, a stop flange is provided between the first and second portions. This stop flange limits the depth to which the connection element can be inserted into the foamed plastics member.

10 Advantageously, the stop flange is formed integrally with the two portions, and preferably, the element is made of plastics material by an injection moulding process.

15 The invention also provides connection means comprising a connection element of the type defined above and a fixing element associated with an aperture in the element. The fixing element helps to prevent the connection element being pulled out from the foamed plastics member when it is driven through an aperture in the connection element.

20 Preferably, the fixing element has an elongate portion which, in use, passes through an aperture in the connection element, and a stop member at one end thereof. The stop member limits the extend to which the fixing element can be inserted into the foamed plastics member.

25 If the first portion of the connection element is fitted near an edge of the foamed plastics member, the fixing element can be inserted substantially at right-angles from the adjacent side of the foamed plastics member. If however, the connection element is not inserted near the edge of the foamed plastics member, the fixing element is pushed in from the same side of the foamed plastics member as the connection element so that its elongate portion passes through the first portion of the connection element at a wide angle to that portion. Since the first portion preferably has a number of apertures, it should always possible to form a cross-connection irrespective of the angle at which the fixing element is inserted.

30 Advantageously, the other end of the elongate portion is pointed. This enables the fixing element to penetrate the foamed plastics member easily and, by avoiding crumbling of the plastics material, ensures good anchorage.

35 Preferably, the stop member of the fixing element is cylindrical. This enables the fixing element to be inserted and the cylindrical stop pressed into the surface of the foamed plastics part so that a smooth surface, uninterrupted by any projecting parts, is provided.

40 The connection element and means defined above are particularly useful for attaching toy models to toy scenery made up from foamed plastics members. Thus, toy models can easily be moved to different

parts of a given scenery and new models added at any time.

Connection means constructed in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a part-sectional elevation of the connection means anchored in a foamed plastics member; and

Figure 2 is a perspective view of the connection means.

Referring to the drawings, Figure 2 shows a connection element 1 having a flat fixing portion 2 in which is formed a plurality of apertures 3 through which a fixing element 4 can pass. To facilitate the passage of the fixing element 4 through these apertures 3, both mouths of each aperture are flared by means of inclined lead-in surfaces 5. At the end of the connection element 1 remote from its fixing portion 2 is re-entrant connector tenon 6 which is suitable for adding a component 7 of a toy building set (see Figure 1). Between the connector tenon 6 and the fixing portion 2 is a stop flange 8 which limits the depth of insertion of the connection element 1 into a foamed plastics member 9.

In order to connect the component 7 to the foamed plastics member 9, the fixing portion 2 of the connection element 1 is pushed into the foamed plastics member, at right-angles to the upper surface thereof, until the flange 8 prevents further insertion. The component 7 can then be fixed to the connection element 1 by sliding the re-entrant tenon 6 into a re-entrant groove 7a. To prevent the connection element 1 from being pulled out of the foamed plastics member 9 after it has been inserted therein, the fixing element 4 is inserted transversely to the fixing portion 2 of the connection element, the cross-section of the shank 10 of the fixing element corresponding to that of each of the apertures 3 formed in the fixing portion. To facilitate insertion into the foamed plastics material 9, the shank 10 has a pointed end and is of flat elongate form. To limit the depth to which it can be inserted, the fixing element 4 has a transverse cylindrical bar 11 at the end opposite its pointed end, which bar together with the shank 10 forms a T.

WHAT I CLAIM IS:—

1. A connection element for securing a component of a toy building set to a foamed plastics member, the element comprising a first portion which can be pressed into the foamed plastics member and a second portion which, in use, lies outside the foamed plastics member and which is securable to a toy building component, the first portion being a flat elongate member

65

70

75

80

85

90

95

100

105

110

115

120

125

connector of the connection element is a re-entrant tenon.

5 Preferably, a stop flange is provided between the first and second portions. This stop flange limits the depth to which the connection element can be inserted into the foamed plastics member.

10 Advantageously, the stop flange is formed integrally with the two portions, and preferably, the element is made of plastics material by an injection moulding process.

15 The invention also provides connection means comprising a connection element of the type defined above and a fixing element associated with an aperture in the element. The fixing element helps to prevent the connection element being pulled out from the foamed plastics member when it is driven through an aperture in the connection element.

20 Preferably, the fixing element has an elongate portion which, in use, passes through an aperture in the connection element, and a stop member at one end thereof. The stop member limits the extend to which the fixing element can be inserted into the foamed plastics member.

30 If the first portion of the connection element is fitted near an edge of the foamed plastics member, the fixing element can be inserted substantially at right-angles from the adjacent side of the foamed plastics member. If however, the connection element is not inserted near the edge of the foamed plastics member, the fixing element is pushed in from the same side of the foamed plastics member as the connection element so that its elongate portion passes through the first portion of the connection element at a wide angle to that portion. Since the first portion preferably has a number of apertures, it should always possible to form a cross-connection irrespective of the angle at which the fixing element is inserted.

45 Advantageously, the other end of the elongate portion is pointed. This enables the fixing element to penetrate the foamed plastics member easily and, by avoiding crumbling of the plastics material, ensures good anchorage.

50 Preferably, the stop member of the fixing element is cylindrical. This enables the fixing element to be inserted and the cylindrical stop pressed into the surface of the foamed plastics part so that a smooth surface, uninterrupted by any projecting parts, is provided.

60 The connection element and means defined above are particularly useful for attaching toy models to toy scenery made up from foamed plastics members. Thus, toy models can easily be moved to different

parts of a given scenery and new models added at any time.

Connection means constructed in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a part-sectional elevation of the connection means anchored in a foamed plastics member; and

Figure 2 is a perspective view of the connection means.

Referring to the drawings, Figure 2 shows a connection element 1 having a flat fixing portion 2 in which is formed a plurality of apertures 3 through which a fixing element 4 can pass. To facilitate the passage of the fixing element 4 through these apertures 3, both mouths of each aperture are flared by means of inclined lead-in surfaces 5. At the end of the connection element 1 remote from its fixing portion 2 is re-entrant connector tenon 6 which is suitable for adding a component 7 of a toy building set (see Figure 1). Between the connector tenon 6 and the fixing portion 2 is a stop flange 8 which limits the depth of insertion of the connection element 1 into a foamed plastics member 9.

In order to connect the component 7 to the foamed plastics member 9, the fixing portion 2 of the connection element 1 is pushed into the foamed plastics member, at right-angles to the upper surface thereof, until the flange 8 prevents further insertion. The component 7 can then be fixed to the connection element 1 by sliding the re-entrant tenon 6 into a re-entrant groove 7a. To prevent the connection element 1 from being pulled out of the foamed plastics member 9 after it has been inserted therein, the fixing element 4 is inserted transversely to the fixing portion 2 of the connection element, the cross-section of the shank 10 of the fixing element corresponding to that of each of the apertures 3 formed in the fixing portion. To facilitate insertion into the foamed plastics material 9, the shank 10 has a pointed end and is of flat elongate form. To limit the depth to which it can be inserted, the fixing element 4 has a transverse cylindrical bar 11 at the end opposite its pointed end, which bar together with the shank 10 forms a T.

WHAT I CLAIM IS:—

1. A connection element for securing a component of a toy building set to a foamed plastics member, the element comprising a first portion which can be pressed into the foamed plastics member and a second portion which, in use, lies outside the foamed plastics member and which is securable to a toy building component, the first portion being a flat elongate member



which is pointed at its free end and being formed with at least one aperture through which a fixing element can be driven, wherein the second portion includes a connector of the groove-and-tenon type.

2. A connection element as claimed in claim 1, wherein both mouths of the or each aperture in the first portion are flared by means of inclined lead-in surfaces.

3. A connection element as claimed in claim 1 or claim 2, wherein the connector is a re-entrant tenon.

4. A connection element as claimed in any one of claims 1 to 3, wherein a stop flange is provided between the first and second portions.

5. A connection element as claimed in claim 4, wherein the stop flange is formed integrally with the two portions.

6. A connection element as claimed in any one of claims 1 to 5, wherein the connection element is made of plastics material by an injection moulding process.

7. Connection means comprising a connection element as claimed in any one of claims 1 to 6 and a fixing element associated with an aperture in the element.

8. Connection means as claimed in claim 7, wherein the fixing element has an elongate portion which, in use, passes through an aperture in the connection element, and a stop member at one end thereof.

9. Connection means as claimed in claim 8, wherein the other end of the elongate portion is pointed.

10. Connection means as claimed in claim 8 or claim 9, wherein the stop member is cylindrical.

11. A connection element substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

12. Connection means substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

ABEL & IMRAY,
Chartered Patent Agents,
Northumberland House,
303—306, High Holborn,
London, WC1V 7LH.

Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1976.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from
which copies may be obtained.



* C L M S *