(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 393 000 A1**

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **90850120.8**

(51) Int. Cl.5: **E04B 9/28**

(22) Date of filing: **28.03.90**

(30) Priority: **13.04.89 SE 8901339**

(43) Date of publication of application:
17.10.90 Bulletin 90/42

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI LU NL SE

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(54) **An auxiliary device for use when fitting false-ceilings.**

(57) An auxiliary device (10) for use in the so-called concealed fitting of false-ceiling (24,28,30) elements to a load bearing structure (26). The device (10) enables a ceiling element (24,28,30) to be removed and re-fitted without needing to remove the device (10) from the bearing structure (26). The novel auxiliary device (10) has the form of a spring clip. This clip includes a securing member (12, 16, 18) which is operative to grip over the bearing structure (26), such as to lock the clip in relation to the bearing structure (26), and further includes one or more resilient member (20) which project outwards from the securing member (12,16,18). The spring members (20) are measurement-adapted so as to press resiliently against the upper surface of a fitted ceiling element (24,28,30) such as to hold the ceiling element (24,28,30) in its normal position.

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AN AUXILIARY DEVICE FOR USE WHEN FITTING FALSE-CEILINGS

The present invention relates to an auxiliary device for use in the concealed fitting of false-ceilings to a load bearing structure, said device - preferably when the structural members of the load bearing structure are known D-profiles - in addition to holding a false-ceiling element securely in position also enabling a false-ceiling element to be removed and re-fitted to the ceiling without needing to remove the auxiliary device from the load bearing structure.

Several different types of load bearing structures are used to support the individual elements of false-ceiling constructions or similar constructions. These constructions fall into two main categories, namely a construction category in which the ceiling fittings are visible, and a construction category in which the ceiling fittings are concealed. In those cases where the ceiling fittings are visible, it is normally quite easy to remove and refit the ceiling elements, since they rest on support ledges on the bearing structure without being locked thereto. In the case of concealed fittings there has long been used a construction intended for false-ceiling elements having edge-configuration C in accordance with Swedish Standard (SS 815 112). This construction, however, locks the individual false-ceiling elements, such as to prevent said elements from being removed individually. In this case, it is necessary to commence dismantling of the ceiling from one side thereof.

Many architects and users desire the aesthetic advantages afforded by concealed fittings, inter alia because the actual bearing or supporting construction need not be seen. At the same time, however, it is desirous that an individual ceiling element can be removed readily from the ceiling. With this in mind, a new edge-configuration D, in accordance with the aforesaid Swedish Standards, has been produced in relatively recent times. Edge-configuration D enables each individual false ceiling element to be removed and refitted by combined lifting and lateral displacement of respective ceiling elements.

It is found, however, that the construction having edge-configuration D has certain limitations. False-ceiling elements which are light in weight can be difficult to fit into position, due to the friction which acts between the elements themselves or between the ceiling-elements and the bearing structure. Consequently, re-fitting of a ceiling element removed for inspection purposes or for some other reason may result in irregularities in the ceiling surface, therewith detracting from the earlier attractiveness of the ceiling.

Another problem which has the same end result occurs when cleaning the false-ceiling elements, this work normally being carried out with the ceiling elements in position in the ceiling. Cleaning of the ceiling elements is made difficult because the elements yield, i.e. lift, when subjected to pressure from beneath. Those elements which are lifted give rise to the same problem as that experienced when refitting ceiling elements that have been removed from the ceiling, i.e. the raised ceiling elements do not return fully to their original, intended position.

Another circumstance in which the ceiling elements can be subjected to a lifting force is when the pressure in a ventilation system changes rapidly or when a door is slammed. The lifting forces generated in such circumstances can also result in the aforesaid problem of ceiling elements failing to return to their original, intended position.

The abovementioned drawbacks associated with known techniques are eliminated by means of the inventive auxiliary device. This is made possible because the auxiliary device mentioned in the aforegoing has, in accordance with the invention, the form of a spring clip which comprises a securing member operative to grip over the bearing structure and to lock the clip in relation to said structure, and also one or more spring legs which project outwards from the securing member and the measurements of which are adapted so that the leg, or legs, will bear resiliently against the upper surface of a respective ceiling element and therewith retain said element in its intended position.

Further features of the invention are set forth in the following claims.

The invention will now be described in more detail with reference to a number of exemplifying embodiments thereof and with reference to the accompanying drawings.

Figures 1a and 1b are perspective views and side views respectively of a first embodiment of the invention.

Figures 2a and 2b are a perspective view and a side view respectively of a second embodiment of the invention.

Figures 3a and 3b are a perspective view and a side view respectively of a third embodiment of the invention.

Figures 4a-4c are sectioned views taken from one side of the first inventive embodiment and illustrate the various stages of removing false-ceiling elements from a supporting structure, or alternatively re-fitting ceiling elements thereto.

The auxiliary device 10 illustrated in Figure 1 is preferably made of sheet metal or manufactured entirely or partially from, for instance, an injection

moulded plastics material, such as PVC, and has the form of a spring clip of particular configuration. The spring clip comprises two main parts which have mutually different functions, namely a first part which functions as a securing member and a second part which functions as a spring or resilient member and which is integral with said first part.

The securing member of said device includes three different parts. These parts consist of an elongated main part 12, a forwardly located part 14 which projects out from the main part, and a rearwardly located part 16, 18 which also projects out from said main part. In the present case, the forwardly located part 14 is positioned centrally with respect to one long side of the main part 12, and can therefore not be seen in Figure 1a. This part, however, is shown in Figure 1b. The forwardly located part 14 projects from the main part 12 in a manner to form an acute angle between said two parts.

The rearwardly located part first extends perpendicularly (at 16) from the main part 12 and is then terminated with an end part 18 which extends parallel with said main part 12. In the case of the illustrated embodiment, the rearwardly located part 16, 18 is configured so as to comply with the configuration of the bearing structure with which the auxiliary device 10 is to be used.

The spring member of the Figure 1 embodiment includes two mutually identical spring legs 20 which project out from the forward edge of the main part 12 in the proximity of respective ends thereof, so as to present a space between said legs 20. The outer, free end 22 of each leg 20 is curved so as to be able to support against a false-ceiling element without damaging said element.

In Figure 2, those members which have correspondence in Figure 1 are identified with the same reference numerals but in 100-series. The embodiment illustrated in Figure 2 differs from the Figure 1 embodiment in that the rearwardly located part of the device comprises solely one, short part 116 which extends at right angles from the main part 112. The device also includes a forwardly located part 114 which extends along the whole length of the main part 112. It should also be noted that the spring legs 120 of the Figure 2 embodiment are spaced from respective ends of the main part 112.

In Figure 3, those members which have correspondence in Figure 1 are identified with the same reference numerals although in a 200-series. The embodiment of the device illustrated in Figure 3 has the same configuration as the Figure 2 embodiment with respect to the forward part 216 and the rearward part 214. The spring member of the device, however, differs from the spring members of the embodiments illustrated in Figure 1 and Figure 2. The device according to Figure 3 has only one spring leg 220, although this leg is considerably broader than the spring legs of the earlier described embodiments.

Figures 4-4c illustrate three different stages of removing or re-fitting a false-ceiling element 24, said element being supported by a conventional bearing structure in the form of a known D-profile 26 with which the inventive auxiliary device 10 is used. Figure 4 illustrates parts of three different false-ceiling elements 24, 28, 30. Shown on the left is the right-hand part of a first ceiling element 28, whereas shown in the centre is the left-hand and the right-hand part respectively of a second false-ceiling element 24, whereas to the right is shown the left-hand part of a third false-ceiling element 30. The ceiling element 24 rests on the D-profiles 26 along their mutually opposite edges 32, 34 which have mutually different configurations. The left-hand edge 32 has the form of an inverse step, whereas the right-hand edge 34 has the typical form of a step, wherein a slot 36 extends between the actual shoulder surface, or horizontal surface, of the step and the part located thereabove.

Two auxiliary devices 10 configured in accordance with the principles of the invention and corresponding to the embodiment illustrated in Figures 1a and 1b are each disposed on a respective D-profile 26 in accordance with Figure 4a. In this case, the configuration of the rearwardly located part 16, 18 is fully adapted to the corresponding configuration of the D-profile 26. The forwardly located part 14 of the auxiliary device 10 is bent upwards beneath one edge of the upper part of the D-profile 26. The spring member 20 extends from the main part 12 at an angle to the ceiling element 24 and abuts said element with an abutment surface located adjacent the upwardly curved end 22 of the spring member.

When removing or re-fitting the ceiling element 24, the element is lifted from its starting position shown in Figure 4a, firstly upwards through a small distance at said one edge 32 - against the resistive force of the spring member 20 of the spring clip - wherewith the other edge 34 of the ceiling element 24 will still be securely connected to the bearing structure 26, as illustrated in Figure 4b. The ceiling element 24 is then displaced slightly to one side, in the present case to the left, therewith releasing the previously secured edge 34, as illustrated in Figure 4c. The ceiling element 24 can then be dropped and removed.

Re-fitting of the ceiling element is effected in the reverse order. The left-hand edge 32 of the ceiling element 24 is first pressed-up against the spring member 20, which is lifted with lateral movement to the left, so that the right-hand part of the ceiling element (24) will be positioned at the

"correct" level, whereafter the ceiling element 24, with lateral movement to the right, is secured to the opposing edge 34 in the bearing structure 26. The spring member 20 is then permitted to press the ceiling element 24 back into its final position, this position being the starting position illustrated in Figure 4a.

It will be understood that the aforedescribed auxiliary device can be modified within the scope of the following claims. For instance, the rearwardly located part can be configured in many different ways and can comprise either a single part or a plurality of separate parts projecting outwardly from the main part. The spring member and the forwardly located part can be given configurations which differ considerably form those illustrated in conjunction with the aforedescribed embodiments.

Claims

1. An auxiliary device (10; 110; 210) for use in the so-called concealed fitting of false-ceiling elements (24, 28, 30) to a load bearing structure (26) said device - preferably when the load bearing structure used comprises known D-profiles - in addition to holding a false-ceiling element (e.g. 24) in its intended position also enabling a false-ceiling element to be removed and re-fitted to the ceiling, **characterized** in that said device consists in a spring clip comprising a securing member (12, 16, 18; 112, 116; 212, 216) which is operative to grip over the bearing structure (26) and to lock said clip in relation to said structure, and further comprises one or more spring members (20, 120; 220) which project out from the securing member and which are measurement-adapted for resilient abutment with the upper surface of the ceiling element (24) such as to retain said ceiling element in its normal position without needing to remove the auxiliary device from the bearing structure (26).

2. An auxiliary device according to Claim 1, **characterized** in that the securing member comprises an elongated main part (12; 112; 212) which is intended to be placed along the bearing structure (26) on the upper surface thereof; at least one forwardly located part (14, 114; 214) which is configured to grip around or lie in abutment with one side edge of the upper side of the bearing structure (16) at one edge of the main part from which said spring member or members project; and at least one rearwardly located part (16, 18; 116; 118) which is configured for abut ment with or to grip around the other side edge of the upper side of the bearing structure (6) at the oppositely located edge of said main part.

3. A device according to Claim 2, **characterized** in that each of the forwardly located part and rearwardly located part is curved for engagement beneath respective upper side-edges of the bearing structure (26).

4. A device according to any one of Claims 2 and 3, **characterized** in that the angle formed between said spring members (20; 120; 220), in the form of spring legs, and the main part (12; 112; 212) is greater than 90°.

5. A device according to Claim 4, **characterized** in that the outer, free end (22; 122; 222) of each spring leg is curved so as to avoid the occurrnce of sharp edges in abutment with the surface of the ceiling element intended for engagement with said spring legs.

6. A device according to any one of Claims 1-5, **characterized** in that the device is made of metal and has the form of a one-piece structure.

7. A device according to any one of Claims 1-5, **characterized** in that the spring legs and the securing member are made of mutually different materials.

FIG.1

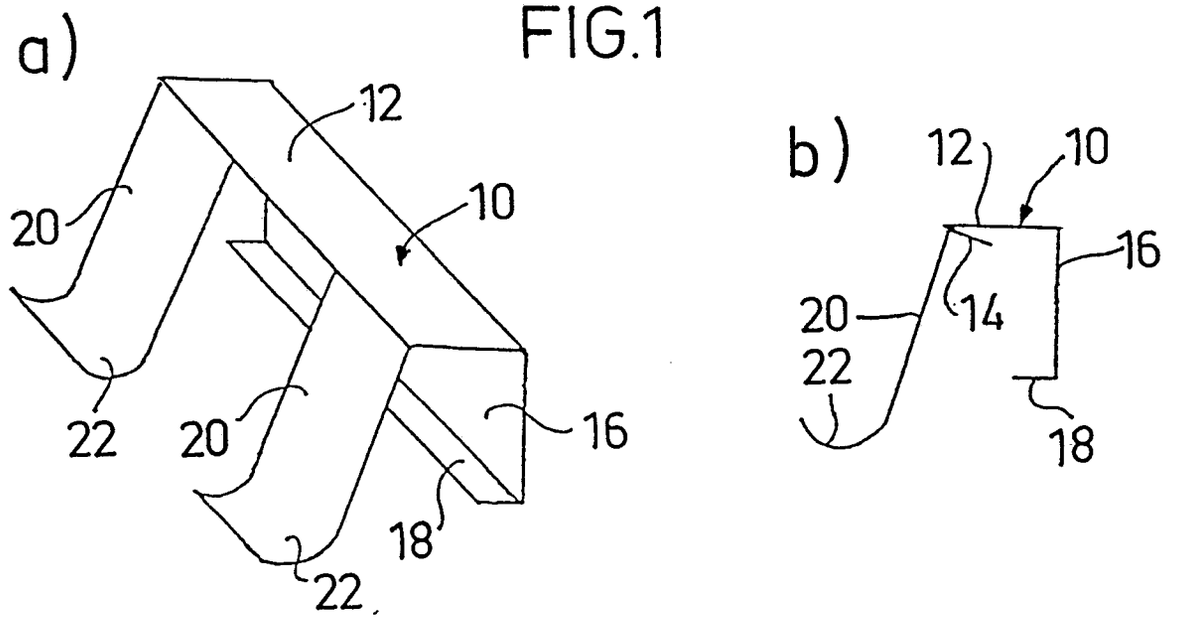


FIG.2

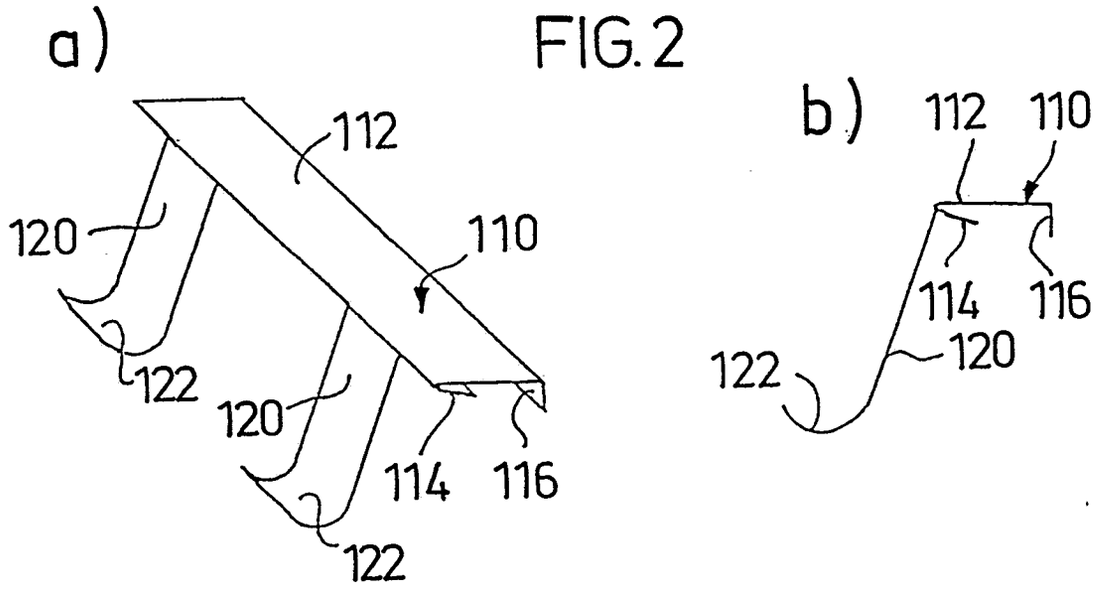


FIG.3

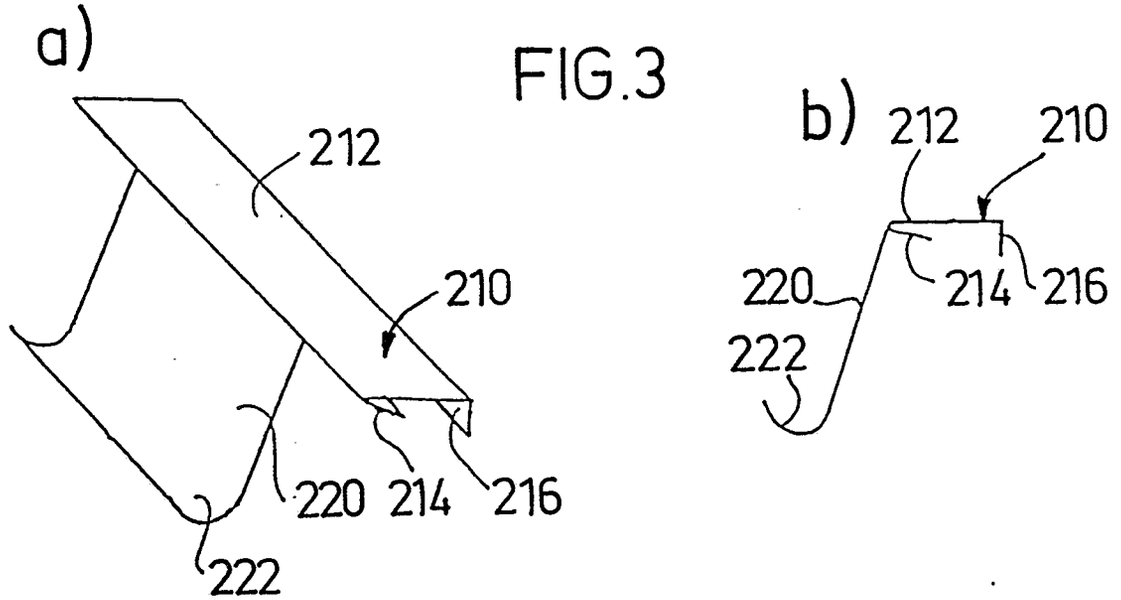


FIG.4a

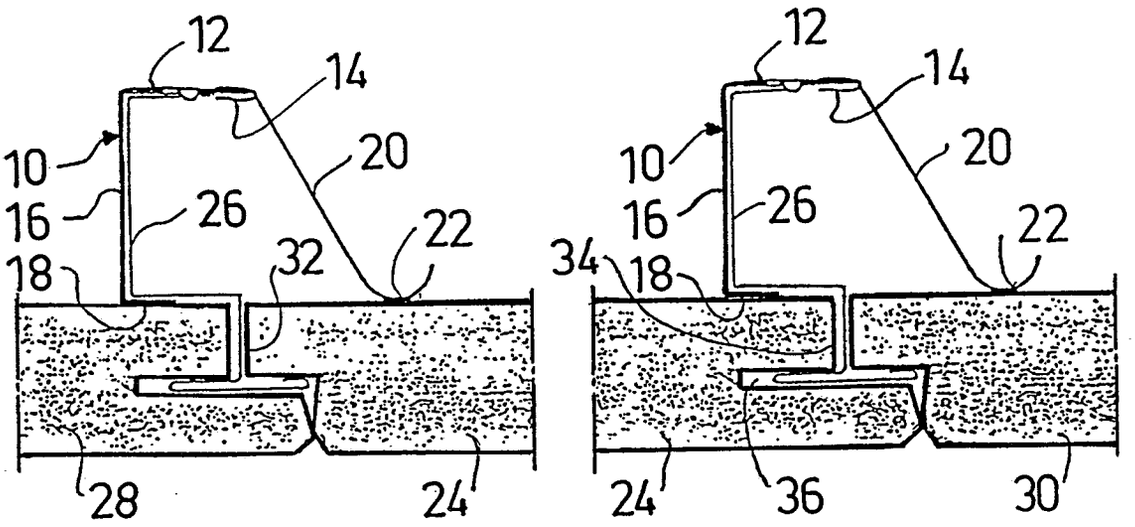


FIG.4b

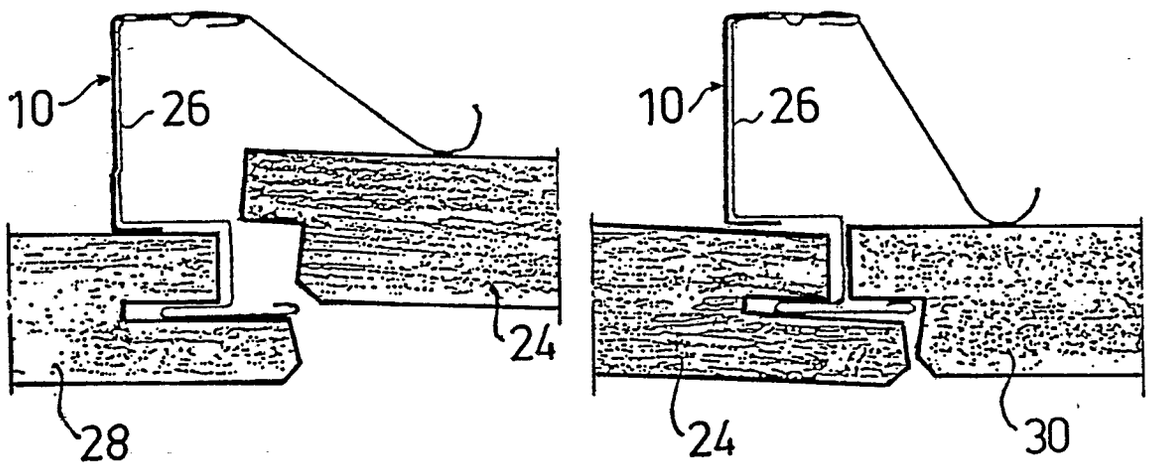
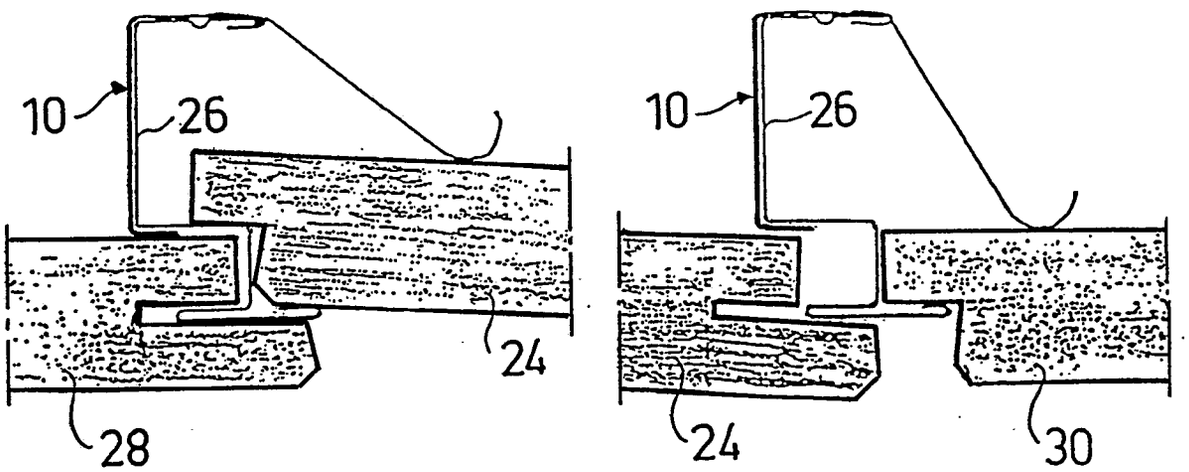


FIG.4c



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EUROPEAN SEARCH REPORT

Application Number

EP 90 85 0120

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)
Y	GB-A-1210498 (R.G.S. PROPRIETARY) * page 1, lines 11 - 55 *	1-6	E04B9/28
Y	US-A-4545166 (W. KIELMEYER) * column 3, line 68 - column 4, line 27 * * column 5, lines 6 - 14; figures 5, 6, 7 *	1, 2, 3, 6	
Y	GB-A-849736 (F.T.PRODUCTS) * page 1, lines 52 - 62 * * page 2, lines 27 - 44; figures 3, 5, 6 *	1, 2, 4, 5, 6	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 JUNE 1990	KRIEKOUKIS S.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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