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

(11) Publication number: **0 161 753**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **85301715.0**

(22) Date of filing: **13.03.85**

(51) Int. Cl.⁴: **E 06 B 3/70**

(30) Priority: **30.03.84 GB 8408223**

(43) Date of publication of application: **21.11.85 Bulletin 85/47**

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

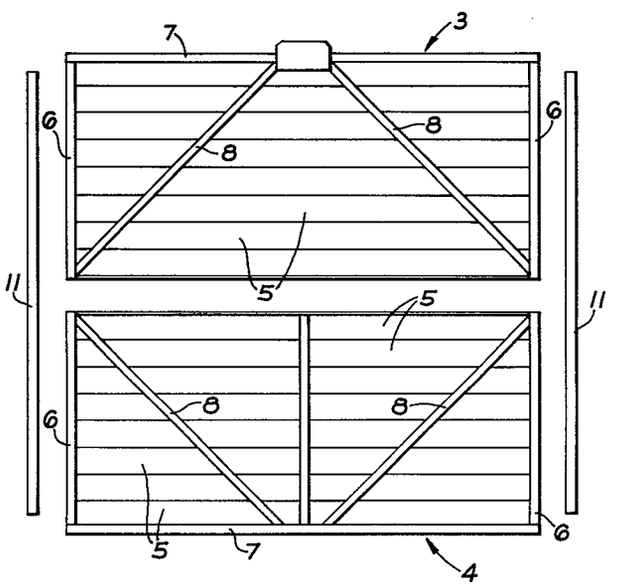
(71) Applicant: **P.C. HENDERSON Limited, Durham Road, Bowburn Co. Durham, DH6 5NG (GB)**

(72) Inventor: **Henry, Derek, 17 North Terrace The Hawthorns, Aycliffe Village Co. Durham (GB)**

(74) Representative: **Virr, Dennis Austin et al, Urquhart-Dykes & Lord Floor B Milburn House Dean Street, Newcastle upon Tyne NE1 1LE (GB)**

(54) Improved garage door.

(57) An improved garage door is in the form of at least two sub-assemblies (3, 4) which may be interlocked (9, 10) to form a door of the desired dimensions, each of the sub-assemblies having one or more bracing struts (8) which run at an angle relative to the edges (6, 7) of the sub-assembly (3, 4) and are confined essentially within the limits of the latter. A preferred means of interlocking (9a, 9b, 10a, 10b) is described.



EP 0 161 753 A1

IMPROVED GARAGE DOOR

The present invention is an improved garage door, which among other characteristics is particularly suitable for erection and installation by the ultimate user.

Conventionally, garage doors are supplied and installed by the building trade and it is inconvenient for the individual householder to attempt to carry out these operations himself. For example, delivery of such doors to the site of installtion must normally be undertaken by the supplier, as conventional garage doors are not suitable for carriage by normally-available domestic transport facilities. However, various social trends including the increased availability of leisure time and the high costs of paid labour have led to the householder wishing to carry out many more tasks himself and the erecting and installing of a new garage door is one of those tasks. It is therefore desirable that a garage door be invented which is suitable for this purpose.

One object of the present invention is therefore to provide a garage door particularly adapted to self-installation by the householder.

The garage door according to the present invention comprises at least two sub-assemblies, which together may be interlocked to form a door of the desired dimensions, each such sub-assembly having one or more bracing struts running at an angle relative to the edges of said sub-assembly and being

confined essentially within the limits thereof.

The door may, as indicated, be formed in more than two sub-assemblies but, in order to provide a sufficiently rigid structure for installation without the user having to fix additional bracing across the door, it is much preferred that the door be formed of just two sub-assemblies. Advantageously, the two sub-assemblies are of similar or equal dimensions. It is possible for the door to be so divided that the join between the sub-assemblies is vertical (in the closed position of the door). However, a particularly preferred embodiment of the invention comprises two sub-assemblies which interlock along a horizontal join.

As indicated, each sub-assembly has one or more bracing struts running at an angle relative to its edges. Thus, for example, each sub-assembly may have one or two bracing struts running diagonally between opposite corners thereof. A particularly advantageous strut arrangement is one in which a strut runs between, and is secured to, adjacent sides of each sub-assembly in such a way that, in the assembled door, each corner of the latter is braced across.

The bracing struts are confined essentially within the limits of each sub-assembly but may extend a short distance beyond the edges thereof if desired, for example at the interlocking edges of the sub-assemblies. However, it is important if at all possible to confine the struts as stated in order to avoid reducing the attractive portability of the unassembled door.

On or more edges of each sub-assembly may be provided with suitable reinforcement, for example in the form of a batten or angle-section. Preferably, three of the sides are reinforced in this way, the remaining side of each sub-assembly being the one by means of which the sub-assemblies are joined together.

The joining together of the sub-assemblies may be effected in a variety of ways but it is highly desirable that a simple method be adopted and that a weather-proof seal should be obtained as a result. Preferably the method is one which affords additional strength to the door structure and, with this in mind, it is preferred that the method should entail some overlapping of the adjacent edges of the sub-assemblies. A particularly preferred arrangement is that said adjacent edges interlock so that linear relative movement in the plane of the door is restricted or prevented, the sub-assemblies then being further joined, and relative movement transverse to the plane of the door being prevented, by means of the edge strips extending down the sides of the assembled door.

The invention will now be further described with reference to the accompanying drawings, wherein:-

Fig. 1 illustrates the main components of one form of garage door according to the present invention, viewed from the rear; and

Fig. 2 illustrates, in sectional detail, the manner of joining of the sub-assemblies of Fig. 1.

The illustrated door is of the so-called "up-and-over" type, that is one which, when installed, will be mounted to be movable from a vertical closed position upwards and rearwards to an open generally horizontal position. The door comprises two sub-assemblies, 3 and 4, of essentially identical overall dimensions. Each sub-assembly is formed of inter-connected aligned parallel panels 5, closely fitted so as to present a uniform decorated surface. The method of linking adjacent panels is identical to that hereinafter described for joining together the sub-assemblies.

Each sub-assembly is reinforced along its side edges with angle-sections 6. Reinforcing edging 7 is fitted along the transverse edges which form the upper and lower edges of the door when assembled. The sub-assemblies are each braced by bracing struts 8, which each extends across a corner from an angle-section 6 to the adjacent transverse edge.

The sub-assemblies 3 and 4 are joined together along their free edges by means of inter-locking sections 9 and 10, shown more clearly in Fig. 2, which illustrates the sections just before engagement. The sections 9, 10 comprise lips 9a, 10a and shoulders 9b, 10b respectively. When, from the position shown in Fig. 2, the sub-assembly 3 is rotated into a horizontal position, the shoulders 9b and 10b abut and a close-fitting, water-tight seal is obtained. The sub-assemblies are then secured together by means of side fittings 11, which are secured by screws or bolts to the angle-sections 6 and edging 7.

Mounting of the garage door within the door frame is carried out in conventional manner.

It will be seen that the sub-assemblies of a garage door according to the present invention are of such dimensions that they may be transported without difficulty, for example laid together in a single flat package, within the rear section of a normal hatch-back saloon car or upon a standard roof-rack.

CLAIMS

1. An improved garage door, characterised in that it comprises at least two sub-assemblies, which together may be interlocked to form a door of the desired dimensions, each such sub-assembly having one or more bracing struts running at an angle relative to the edges of said sub-assembly and confined essentially within the limits thereof.

2. An improved garage door according to claim 1, characterised in that it comprises two sub-assemblies of similar or equal dimensions.

3. An improved garage door according to claim 1 or claim 2, characterised in that the sub-assemblies interlock along a horizontal join.

4. An improved garage door according to any of the preceding claims, characterised in that each sub-assembly has one or two bracing struts running diagonally between opposite corners thereof.

5. An improved garage door according to any of claims 1 to 3, characterised in that each sub-assembly has two bracing struts, each running between, and being secured to, adjacent sides thereof such that, in the assembled door, each corner of the door is braced across.

6. An improved garage door according to any of the preceding claims, characterised in that it comprises two sub-assemblies, each provided with reinforcement on three sides thereof, the remaining side of each sub-assembly being the one by which

the sub-assemblies are joined together.

7. An improved garage door according to any of the preceding claims, characterised in that the means of joining together of the sub-assemblies comprises adjacent edges which interlock so that linear relative movement apart of the sub-assemblies in the plane of the door is restricted or prevented, and edge strips extending down the sides of the assembled door to prevent relative movement in a direction transverse to said plane.

8. An improved garage door according to claim 7, characterised in that said interlocking adjacent edges each comprises a re-entrant lip and a shoulder transverse to the plane of the door (Fig. 2) such that, when the respective lips have been engaged, the sub-assemblies may be relatively rotated so that the shoulders abut and relative movement apart of the sub-assemblies in the plane of the door is prevented.

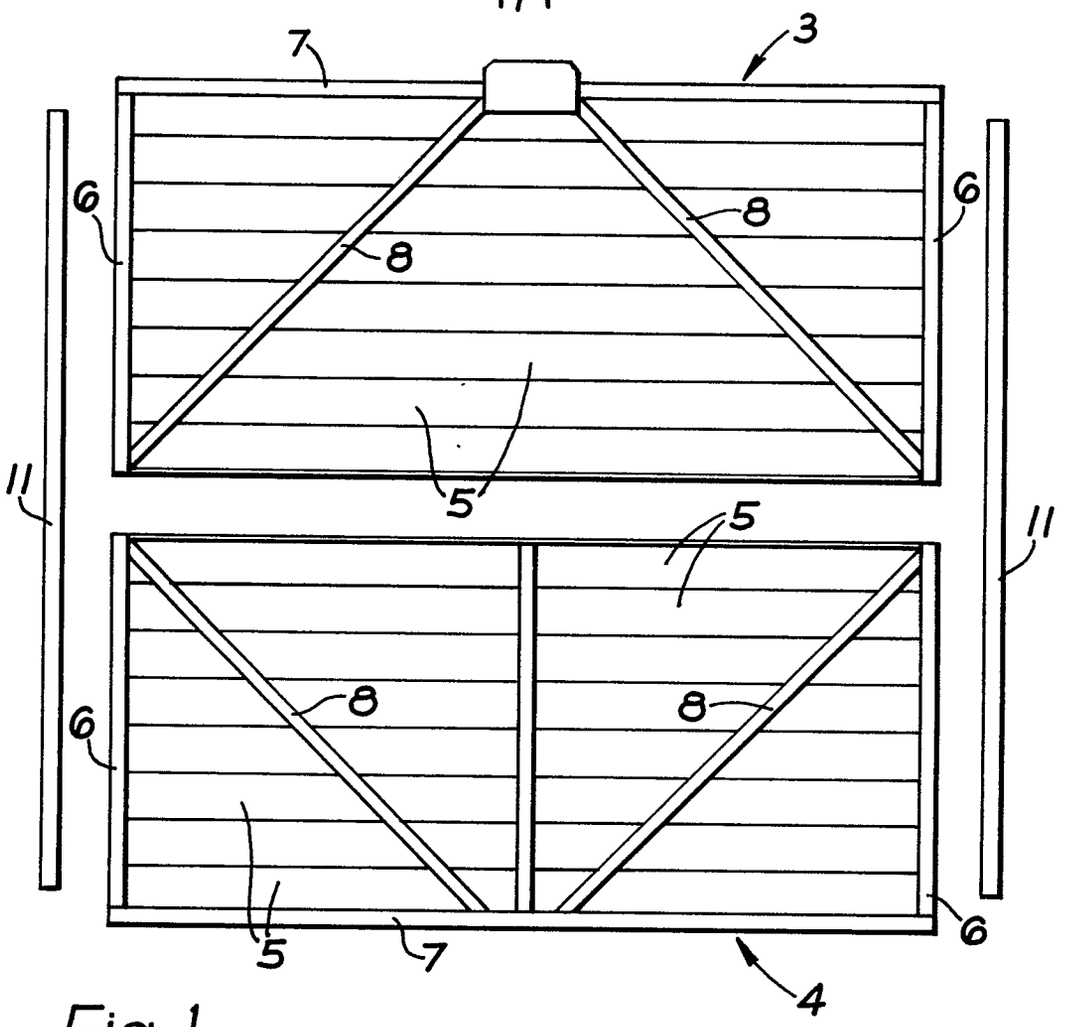


Fig. 1

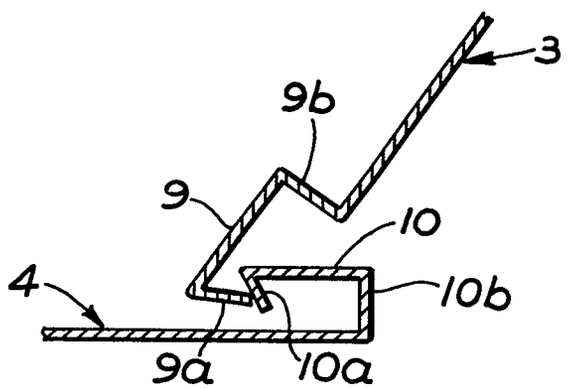


Fig. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 85 30 1715

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	US-A-2 761 532 (COLOMBINI) * Column 1, lines 15-28; column 1, line 53 - column 3, line 26; figures 1-9 *	1-3,7	E 06 B 3/70
Y		4-6,8	

Y	US-A-2 597 786 (FONTAINE) * Column 2, line 39 - column 3, line 5; figures 1-4 *	4	
A		1,3,7	

Y	BE-A- 644 863 (WESTLAND ENGINEERS) * Figure 1 *	5	
	---		TECHNICAL FIELDS SEARCHED (Int. Cl.4)
Y	US-A-2 948 956 (COLOMBINI) * Column 1, line 51 - column 2, line 44; figures 1-4 *	6	E 06 B
A		1-3	

Y	DE-A-1 953 746 (WALDNER) * Page 6, line 5 - page 7, line 12; figures 1,6-9 *	8	
	--- -/-		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10-07-1985	DEPOORTER F.

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

EPO Form 1503. 03.82

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 85 30 1715

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	US-A-2 804 953 (BUEHLER) * Column 2, line 15 - column 4, line 47; figures 1-10 * -----	1,3,5, 7	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10-07-1985	DEPOORTER F.

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

EPO Form 1503 03.82