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I-33170 Pordenone (IT)(54) **Sunshade arrangement with extensible arms.**

(57) The sunshade arrangement comprises a roll-up drum (5) for a sunshade awning (6) which is attached to a front crosspiece (7) mounted on extensible arms (8). Said extensible arms comprise two length portions of hollow profiled metal section (9, 10) that are connected to each other by means of an articulated elbow joint (11) and elastic biasing means (13, 14) that are adapted to normally keep said extensible arms in the extended position of said sunshade awning. Said elastic biasing means (13, 14) are housed inside said hollow profiled metal sections (9, 10), each one of which comprises two complementary longitudinal portions (24, 25) that have an open cross-section contour and are joined to each other along their sides by means of snap-fitting coupling means (27, 28), so that free lateral access is gained to the inside of said profiled metal sections when said complementary portions (24, 25) are separated.

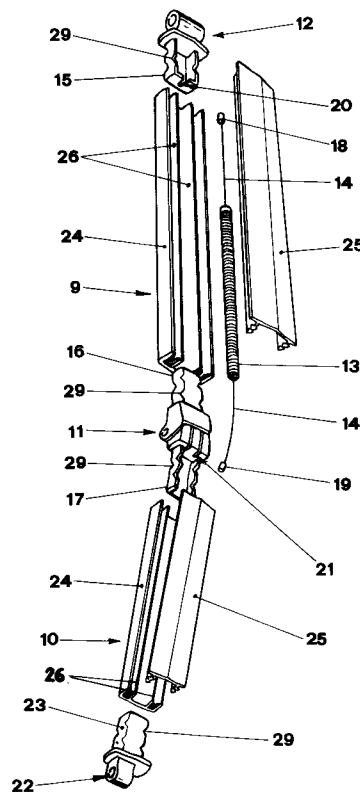


fig. 2

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This invention relates to a sunshade arrangement with extensible arms, that is an awning of the type comprising a support frame with at least a pair of articulated arms that are adapted to be stretched out by means of elastic biasing means so as to normally keep a sunshade awning in its open or extended position.

It is commonly known that such sunshade arrangements with extensible arms are further provided with a roll-up drum which is adapted to be actuated, against the force of said elastic biasing means, so as to roll up the awning into the closed or retracted position of the sunshade arrangement and, at the same time, to fold back the extensible arms.

In particular, each one of said extensible arms usually comprises a first and a second length portion (that are called "arm" and "forearm", respectively) that are made of profiled metal sections and are interconnected in correspondence of a respective end by means of an elbow-type articulated joint. The other end of said first length portion is hinged, by means of a "shoulder"-like articulated joint, on an attachment bracket situated close to the roll-up drum, whereas a front crosspiece, to which the sunshade awning is attached, is hinged on the free end of said second length portion.

The afore cited elastic biasing means comprise at least a tension spring whose ends are hooked, through metal cables or connection chains, to said articulated shoulder joint on one side and, on the other side, that portion of said articulated elbow joint which is attached to the forearm. This system of spring-loaded connection, which demands a relatively large space lengthwise, allows for the spring to be appropriately sized so as to provide the extensible arm with the high tractional force that is required to ensure a correct opening of the awning in its stretched-out position, while at the same time minimizing any possible relaxation of the spring following repeated actuation of the same awning into its retracted position.

Usually, the two lengths of the extensible arm are formed by respective profiled hollow metal sections, which have a variably shaped (for instance rectangular, circular, elliptical, etc.) closed cross-section and inside which said biasing spring is mounted along with its associated connection means in a concealed way so as to extend along the whole axial length of said first arm section and continue into said forearm section downstream of said articulated elbow joint.

In particular, the spring shall be hooked on to the articulated shoulder joint, shall be introduced in the first arm length portion and, at its opposite end, shall finally be hooked on to the forearm length portion under biasing conditions. As a consequence, owing to the closed cross-section of the

profiled hollow metal sections forming the extensible arm, assembling the spring and the connection means associated therewith turns out to be a relatively time-consuming, difficult task which shall be performed manually by skilled workers using special tools.

Furthermore, the components forming said articulated joints shall be attached axially to the respective ends of the arm and forearm length portions, so that they include extensions that must be inserted in a butt-joint like manner in the afore cited respective ends of the hollow profiled metal sections, and then fixed to the same profiled sections. Said attachment can be performed by way of adhesive joining, but such fastening means as screws, rivets and the like are in general preferred in order to give a greater strength to the assembly being formed in this way.

Such a traditional fastening of the articulated joints to the profiled sections makes the assembly of the sunshade arrangement with extensible arms still more complicated, said sunshade arrangement turning in this way out to be undesirably too costly and time-consuming to be effectively manufactured on an industrial scale.

In addition, said fastening screws or rivets turn out to protrude to an undesirable extent outwards from said extensible arms, so that they are not only aesthetically objectionable, but become also the seat of dirt accumulations and, where they are featuring sharp edges as they frequently do, are likely to injure anyone who happens to put his or her hands on the extensible arms, for instance to cleaning or general maintenance purposes.

It therefore would be desirable, and it is actually a major purpose of the present invention, to provide a sunshade arrangement with extensible arms having a sufficiently robust structure to enable it to be conveniently, rapidly and easily assembled in a cost-effective way.

It is a further purpose of the present invention to provide a sunshade arrangement of the afore cited type, which is capable of ensuring rapid, easy and convenient access to the main functional component parts in view of performing possibly required cleaning or repair tasks.

According to the present invention, such targets are reached in a sunshade arrangement with extensible arms which embodies the characteristics and features as recited in the appended claims.

The invention will be further described, and its particular advantages outlined, by way of non-limiting example with reference to the accompanying drawings in which:

- Figure 1 is a schematical, perspective view of a sunshade arrangement according to the present invention;

- Figure 2 is an exploded view of an enlarged detail of the sunshade arrangement shown in Figure 1, in a preferred embodiment of the same;
- Figure 3 is a cross-sectional view of the detail shown in Figure 2.

Referring in particular to Figures 1 and 2, it can be noticed that the sunshade arrangement comprises essentially a rear roll-up drum 5 for a sunshade awning 6 which is fixed to a front crosspiece 7. This front crosspiece is in turn hinged on to the ends of at least two articulated arms 8 which, as it will be explained in detail further on, are extensible from a folded-up, retracted position, in which the sunshade awning is rolled up, ie. closed, to a full stretched-out position, in which the sunshade awning is fully unrolled, ie. open (as shown in Figure 1).

Each one of said extensible arms 8 comprises a first and a second length portions 9, 10 which are made of profiled metal sections, for instance of aluminium alloy, and are interconnected by means of an articulated elbow joint 11. The rear end of said first profiled metal section 9 is hinged by means of an articulated shoulder joint 12 on to a supporting frame, or bracket (not shown for the sake of simplicity), which in a *per se* known manner is adapted to be installed on a wall so as to act as a support for the whole sunshade arrangement.

The metal profile-section length portions 9 and 10 have a hollow construction and, when fully assembled for final installation, they show a closed cross-section configuration which may be given any desired shape, for instance a polygonal shape as shown in Figure 3, or a circular shape, a rectangular shape, etc.

At least one of said extensible arms 8 is provided with elastic biasing means which tend to normally keep the sunshade awning in its extended, ie. open position, with the arms 8 in their stretched-out position shown in Figure 1. When the sunshade awning shall then be closed, ie. retracted, all it takes is actuating the drum 5 accordingly, by means of hand-driven or motor-driven actuation means (of some known type, not shown), so as to roll up the awning 6 and fold up, ie. retract the extensible arms 8 against the force of said elastic biasing means.

In a preferred way, said elastic biasing means comprise at least a tension spring 13 which, by means of connecting cables 14, chains or the like, is hooked on to the articulated shoulder joint 12 on one side and, on the opposite side, to that portion of the articulated elbow joint 11 which is fixed to the fore profile-section length portion 10.

In particular, said articulated shoulder joint 12 comprises an extension 15 fixed to the rear end of the profile-section length portion 9, while the op-

posite ends of the articulated elbow joint 11 are provided with similar extensions 16, 17 which are fixed to the fore end of the profile-section length portion 9 and the rear end of the profile-section length portion 10, respectively. The biasing spring 13 and the respective connecting cables 14 essentially extend inside said hollow profiled metal sections 9 and 10, with terminal hook-on enlargements 18, 19 that fit into a throat 20, which is provided in the articulated shoulder joint 12, and a throat or groove 21, which is provided on that portion of the articulated elbow joint 11 which is connected to the fore profile-section length portion 10, respectively.

In a preferred way, the spring 13 is housed inside the profiled metal section 9, from which the connecting cable 14 will then extend toward the fore profile-section length portion 10 by running in a *per se* known manner around the articulated elbow joint 11 in correspondence of the groove 21.

Furthermore, each extensible arm 8 is in a preferred way hinged on to the front crosspiece 7 by means of a respective ferrule 22 having an extension 23 that is fixed to the fore end of the profile-section length portion 10.

According to an important feature of the present invention, in each one of the extensible arms 8 at least the length portion 9 of hollow profiled metal section, which houses the spring 13 and the major part of the related connecting cables 14, is formed by two longitudinal portions 24, 25 that are complementary to each other and are coupled to each other laterally by means of detachable fastening means.

In a preferred manner, anyway, both the first and the second length portion 9, 10 of hollow profiled metal section are formed by similar complementary portions 24, 25, as this is shown in Figure 2. In particular, said complementary portions 24, 25 are provided with a respective open cross-section; in the example being described, the portion 24 has an essentially C-shaped cross-section, while its complementary section 25 is essentially flat (Figure 3). As a consequence, the assembly of the component parts that build up each extensible arm 8 can be performed in an extremely convenient, rapid and safe way, owing to the possibility of freely gaining access sideways to the entire inner surface of the hollow profile-section length portions 9, 10 before the respective complementary portions 24 and 25 are assembled together. In particular, it is possible to carry out the assembly of the various component parts by for instance placing the portion 24 of the profiled metal section 9 on a horizontal plane, inserting the biasing means 13, 14 inside it, placing the articulated joints 11 and 12 in their respective positions, and then hooking on the terminals 18, 19 to the throat 20 and the groove 21, under simultaneous pre-loading of the

spring 13. Finally, the two complementary portions 24 and 25 are coupled to each other so as to essentially enclose the spring 13 and the connecting cables 14 inside the extensible arm 8.

In this way, therefore, no special tool is actually required to perform the whole assembly process, which can be carried out in an advantageously elementary way and, as anyone skilled in the art would quite easily appreciate, can be easily automated. Furthermore, the complementary portions 24 and 25 can be easily separated, thereby creating the possibility of gaining convenient access inside the respective profiled metal sections in order to carry out possibly needed maintenance, cleaning, repairs or part replacements.

The detachable fastening means with which said complementary portions 24 and 25 are coupled to each other may include screws, rivets and the like. In a preferred way, however, said complementary portions are mutually fastened by means of snap-fitting means provided in correspondence of respective mating edges.

As shown in Figures 2 and 3, for instance, at least the portion 24 comprises reinforcing ribs 26 that extend longitudinally inside it and define, along with the outer walls of the respective profiled metal section, respective hollow spaces in which is housed at least a body of elastic material 27, or the like, comprising an appropriately shaped recess adapted to receive in a forced-in way a corresponding protrusion 28 provided on the inner surface of the complementary portion 25.

As a consequence, said complementary portions 24 and 25 can be assembled and disassembled in a very convenient, easy and rapid way.

Furthermore, according to another feature of the present invention, the extension 15 of the articulated shoulder joint 12 and the extensions 16, 17 of the articulated elbow joint 11 are shaped to comprise lateral fit-in means, including for instance notches or serrations 29, or the like, that are adapted to laterally get engaged with corresponding fit-in means (not shown for the sake of simplicity) provided inside of the associated profiled metal sections 9, 10. In a preferred way, said corresponding fit-in means are formed by positioning the extensions of the articulated joints 11, 12 sidewise inside the respective portions 24 of profiled metal section and deforming the ribs 26 accordingly under the coupling of shapes. Therefore, the articulated joints 11 and 12 can be fixed to the respective profiled metal sections 9, 10, before the complementary portions 24, 25 are actually assembled together, by simply positioning them sidewise so as to bring about the above illustrated restrained joint that fixes them into an axial position.

In a preferred way, also the ferrules 22 are attached to their respective length portions 10 of

profiled metal section by means of similar snap-fitting fastening means 29 provided in correspondence of the extensions 23 and capable of getting hooked on, by the coupling of shapes, to complementary snap-fitting means provided inside said profiled metal sections 10.

As a consequence, assembling the articulated joints 11, 12 and the ferrules 22 to the profiled metal sections associated therewith does not actually require any undesired use of such fastening means as screws, rivets or adhesives; furthermore, it can be carried out in a rapid, easy and fully automatable way.

The resulting, considerable cost reduction effects that can be obtained both in manufacturing and repairing or servicing the sunshade arrangement according to the present invention are fully appreciable.

It will of course be appreciated that the sunshade arrangement that has been described above by way of non-limiting example may be the subject of any modification considered to be appropriate, without departing from the scopes of the invention.

For instance, the elastic biasing means 13, 14 can be arranged in a different way or can be of a different type. For example, they can include pneumatic pushing or pulling pistons or similar devices.

Claims

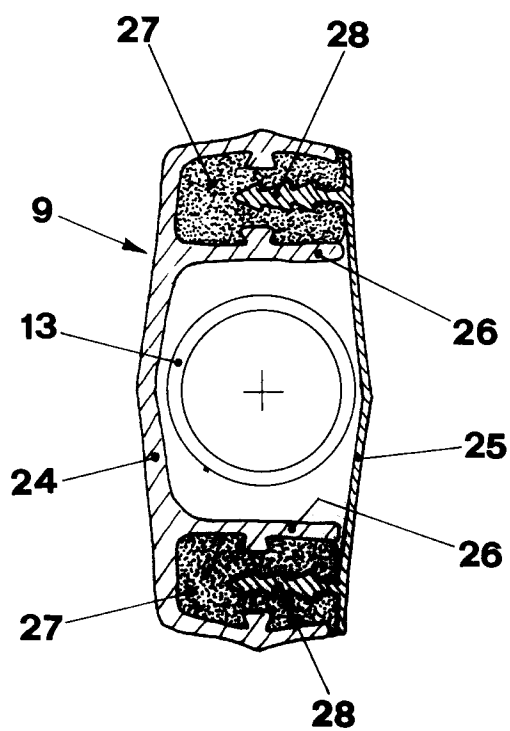
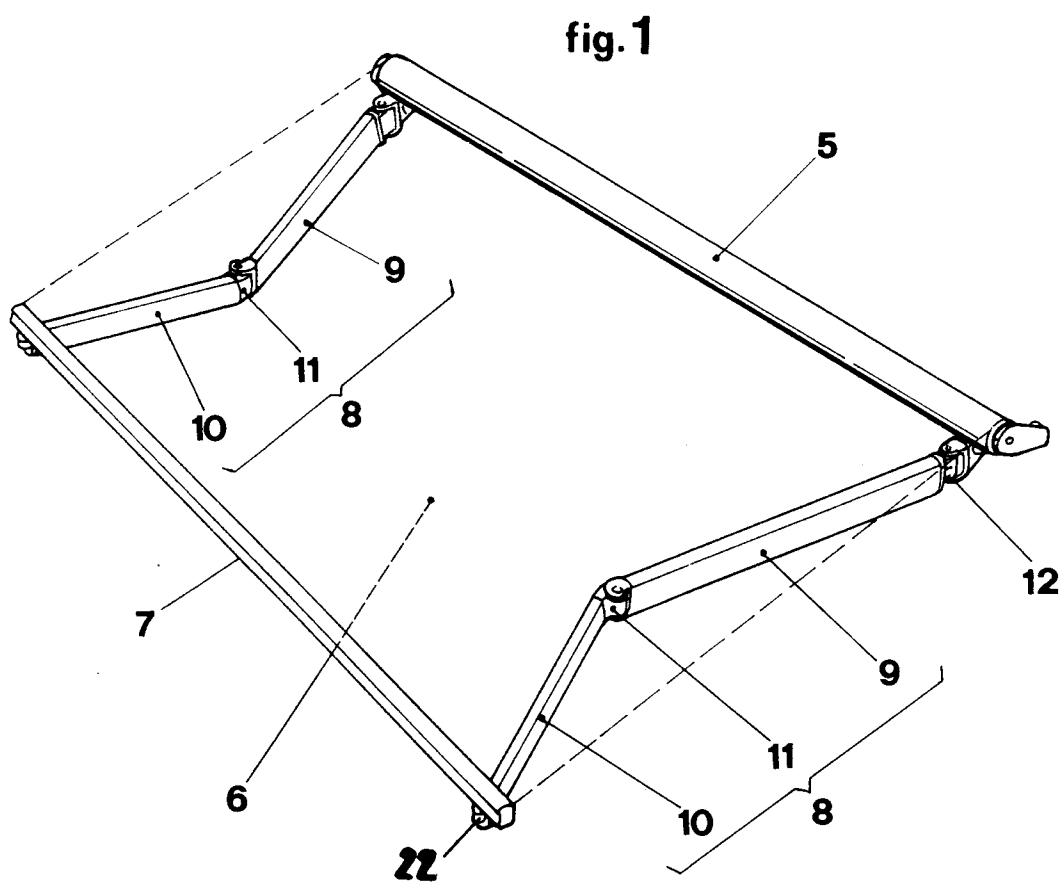
1. Sunshade arrangement comprising a rear roll-up drum for a sunshade awning that is attached to a front crosspiece mounted on at least two articulated arms that are extensible from a retracted position to an extended position of said sunshade awning, each extensible arm comprising a first length portion of hollow profiled metal section with a closed cross-section contour, of which the rear end is hinged by means of an articulated shoulder joint on to a support frame adapted to be mounted on a wall, as well as a second length portion of hollow profiled metal section with a closed cross-section contour that is hinged on to said front cross-piece, said first and second length portions of profiled metal section being connected to each other by means of an articulated elbow joint and elastic biasing means capable of normally keeping the extensible arm in said extended position of the sunshade awning, said elastic biasing means extending essentially inside at least one of said hollow profiled metal sections, **characterized in that** at least one of the hollow profiled metal sections (9, 10) housing said elastic biasing means (13, 14) comprises two complementary longitudinal portions (24, 25) having an open cross-section and laterally coupled to each

other by means of detachable attachment means, so as to provide for free, convenient access sideways to the inside of the hollow profiled metal section when said complementary portions (24, 25) are separated.

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2. Sunshade arrangement according to claim 1, **characterized in that** said detachable attachment means comprise snap-fitting fastening means (27, 28) provided in correspondence of respective mating edges of said complementary portions (24, 25) coupled to each other. 10
3. Sunshade arrangement according to claim 1, wherein said articulated shoulder joint and said articulated elbow joint comprise extensions inserted in respective ends of said first and said second length portion of hollow profiled metal section, **characterized in that** said extensions (15, 16, 17) are attached axially to the respective profiled metal sections (9, 10) by means of fit-in fastening means (29) adapted to hook on laterally by the coupling of shapes to complementary fit-in means provided inside at least one of said complementary portions (24, 25) of the associated profiled metal sections. 15 20 25
4. Sunshade arrangement according to claim 1, wherein the second length portion of profiled metal section of each extensible arm is hinged on to the front crosspiece by means of a hinging ferrule means having an extension inserted in the fore end of said second length portion of profiled metal section, **characterized in that** said extension (23) is attached axially to said second length portion of profiled metal section (10) by means of fit-in fastening means (29) adapted to hook on laterally by the coupling of shapes to complementary fit-in fastening means provided inside at least one of said complementary portions (24, 25) of the second length portion of profiled metal section (10). 30 35 40
5. Sunshade arrangement according to the preceding claims 3 and 4, **characterized in that** said complementary fit-in fastening means are provided on respective reinforcing ribs (26) extending longitudinally inside said hollow profiled metal sections (9, 10). 45 50

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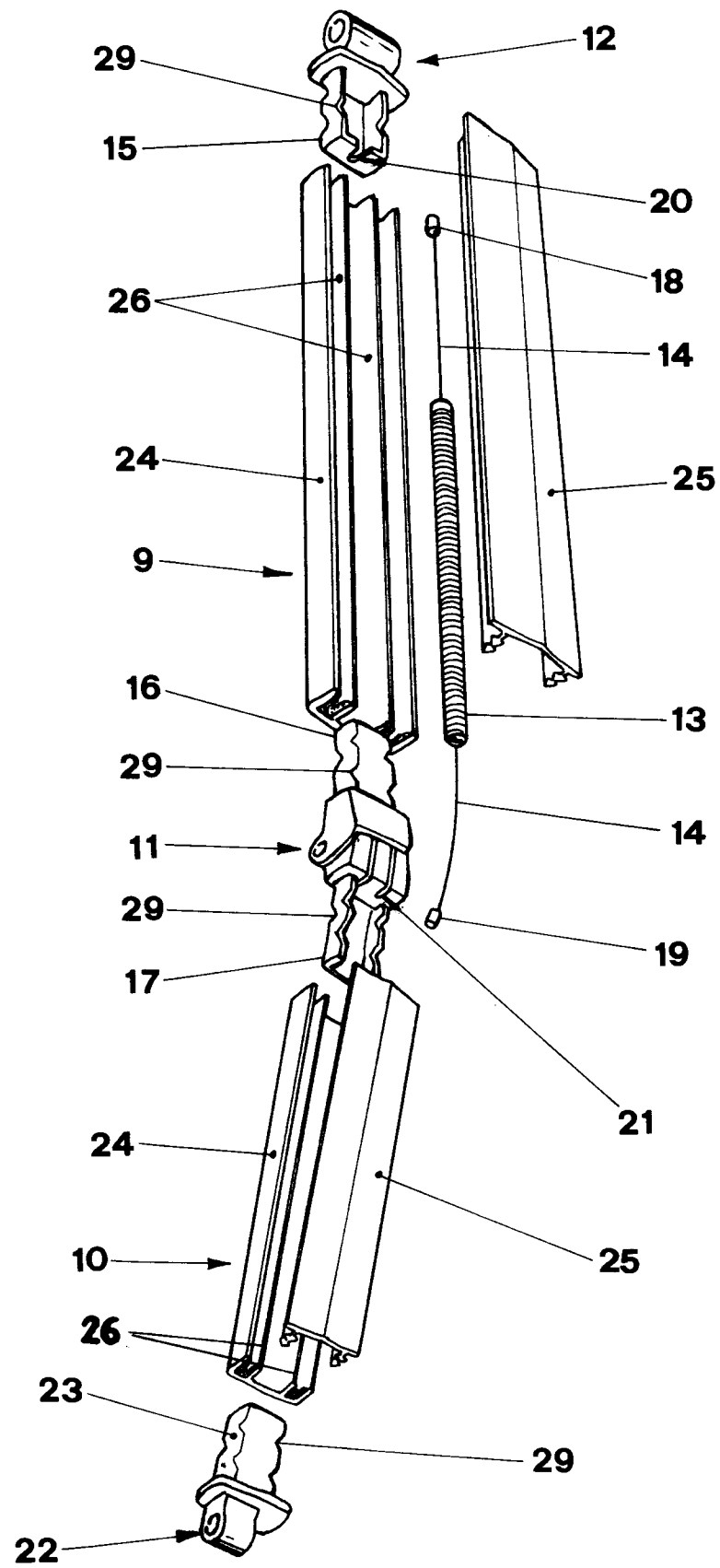


fig. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 94 10 6822

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	EP-A-0 125 727 (MADO NEDERLAND) ---	
A	FR-A-2 519 062 (ETS. LAUZIER) -----	
		CLASSIFICATION OF THE APPLICATION (Int.Cl.5) E04F10/06
		TECHNICAL FIELDS SEARCHED (Int.Cl.5) E04F
The present search report has been drawn up for all claims		
Place of search	Date of completion of the search	Examiner
THE HAGUE	29 August 1994	Vijverman, W
CATEGORY OF CITED DOCUMENTS		
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