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NL-2587 BN 's-Gravenhage (NL)(54) **A device for connecting a profile to a cord and a folding curtain incorporating such a device.**

(57) The device comprising a body (15) bounding a socket (16) for holding a part of a profile (13), an opening (17) for holding a cord (6, 7, 21), and a passage (18) communicating with the opening (17) for sideways entering a cord (6, 7, 21) into the opening (17). The passage (18) intersects the socket (16). A folding curtain incorporating such a device is also described.

Since the passage intersects the socket, the cord can easily be introduced into the opening before a part of the profile is introduced into the socket. Then the socket can be positioned over a part of a profile. After the socket is mounted over a part of the profile, the passage is obstructed by the profile so the cord cannot dislodge transversely from the device.

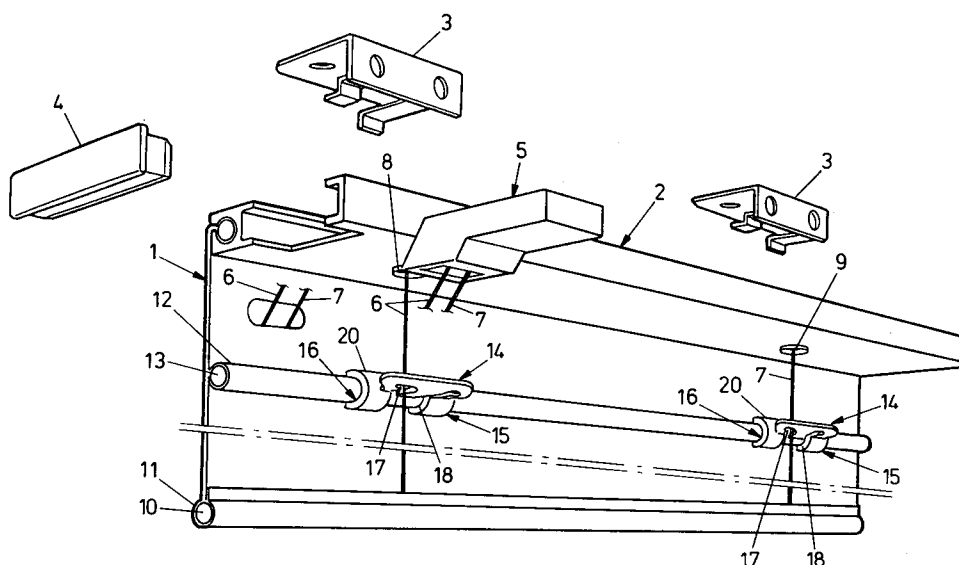


FIG.1

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The invention relates to a device according to the introductory part of claim 1. Such a device is known from EP-A-0 366 917.

In the field of folding blinds with horizontal folds and rods, usually cords for guiding the rods and in some embodiments also cords for maintaining the rods at desired vertical positions along the cords were passed through holes in the rods or eyes provided on web material of the folding blind. Manufacturing such blinds was cumbersome, because it required the provision of holes in the rods positioned in accordance with the width of the blind and threading the cords through the associated holes in the rods. Cleaning or exchanging the web material was equally cumbersome, because it required either removing seams in the web material to be cleaned or exchanged or removing the cords from the holes before cleaning or exchanging and the reverse procedure with the cleaned or exchanged web material.

In the above-mentioned EP-A-0 366 917, a connecting device is disclosed comprising a main body bounding a socket in which a part of a rod can be introduced for holding the rod and the device relative to each other. The device is further provided with two hook shaped members each bounding an opening for holding a cord extending through that opening and bounding a passage communicating with the opening for sideways entering a cord into the opening.

The device can be attached to a rod, depending of the embodiment, by either entering a rod axially into a socket or by snapping flexible legs bounding the socket over a rod. The cord can be introduced into and removed from the openings, even if objects are attached to the cord at opposite sides of the opening, since the cord can be passed transversely through the opening.

A disadvantage of this known system is, that the cords can easily become dislodged from the connecting device. Another disadvantage is that the cord is diverted at each device so that it at least tends to seat itself in a position in which it is held in the opening. This diversion however causes substantial friction at each device, which is undesirable for many applications. Yet another disadvantage of this known system is, that the cord has to be introduced into two openings at each device.

It is an object of the present invention, to provide a device in which the above disadvantages are avoided.

According to the present invention, this object is achieved by providing a device of the initially identified type with the characterizing features of claim 1.

Since the passage intersects the socket, the cord can easily be introduced into the opening before a part of the profile is introduced into the

socket. Then the socket can be positioned over a part of a profile. After the socket is mounted over a part of the profile, the passage is obstructed by the profile so the cord cannot dislodge transversely from the device. Nevertheless, the cord can easily be removed from the opening by removing the socket from the profile. Assembling a cord, a profile and the device is particularly simplified, because the cord only has to be passed into one opening and is automatically locked in place when the socket is mounted over the profile.

According to another, particularly advantageous aspect of the invention, a curtain according to claim 9 is provided.

As the connecting devices are mounted, in a single operation, firstly, the profiles are positioned relative to the web, either by devices mounted to the ends of the profiles and/or by devices sandwiching a part of the web between the profile and the socket, and, secondly, the cords are positioned or guided relative to the profiles and the web. Moreover, since the profiles are enclosed in loops in the web, at least the parts of the profiles traversing the web are not visible from either side of the web, so also at the side where the cords are suspended along the web (generally facing outdoors), the profiles do not disturb the appearance of the curtain. At the outside of the curtain, the only parts provided in front of the web are the connecting devices which may be made of transparent material and the cords which may be of a very small diameter and of a colour adapted to the design of the web material.

Particular embodiments of the invention are set out in the dependent claims.

Below, embodiments of the invention are described in more detail with reference to the accompanying drawings, in which:

Fig. 1 is a perspective, exploded view of a folding curtain according to the invention,

Fig. 2 is a top plan view of a connecting device according to the invention as also incorporated in the folding curtain shown in Fig. 1,

Figs. 3-5 are top plan views of further embodiments of connecting devices according to the invention, and

Figs. 6 and 7 are perspective views of further embodiments of connecting devices according to the invention.

In the drawings, corresponding parts of different embodiments are designated by mutually identical reference numerals.

The invention is first described with reference to the folding curtain shown in Fig. 1 and the connecting device shown in more detail Fig. 2 which represent the presently most preferred embodiments of the invention.

In Fig. 1, a folding curtain is shown which comprises a web 1 which is vertically suspended from a suspension beam 2. To fix the beam 2 to a wall, a ceiling or a window-frame, brackets 3 are provided. An end stop 4 is provided for closing off an end of the beam 3. For pulling up and letting down the web 1, a cord stopping unit 5 is provided including a pulley along which cords 6, 7 are lead from an oblique upward orientation of an end of the cords 6, 7 to be operated to an essentially horizontal orientation (not shown) parallel to the beam 1. From the stopping unit 5, the cords 6, 7 pass to pulleys (not shown) and from the pulleys, via passages 8, 9 in the beam 2, the cords are suspended downward to a rod 10 enclosed in a loop 11 of the web 1 forming the lower end of that web 1. Since Fig. 1 is an exploded representation, parts of the cords 6, 7 extending from the stopping unit are shown as separate sections in another position in the drawing than the position corresponding to the actual position of these parts of the cords when the stopping unit 5 is in mounted position. The web 1 is provided with a perforation 12 near the beam 2 through which ends of the cords 6, 7 to be operated pass obliquely downward.

The web 1 is provided with vertically spaced loops 12 each enclosing a horizontal rod 13. In Fig. 1 one of these loops 12 and one of these rods 13 is shown. A middle section of the web 1 is cut away in the representation shown in Fig. 1. Connecting devices 14 are mounted to the rods 13 where the cords 6, 7 pass the rods 13, each of the connecting devices 14 comprises a body 15. The body 15 also bounds a socket 16 in form of a hollow profile-shaped space in which a part of the rod 13 to which the connecting device is attached is lodged and held. The body 15 further bounds two openings 17 through one of which one of the cords 6, 7 which is guided by that device 14 extends. The body 15 also bounds a passage 18 bifurcating into two branches 19 (see Fig. 2) each communicating with one of the openings 17 for sideways entering a cord 6, 7 into each of the openings 17.

The passage 18 is obstructed by the rod 13, so the cords 6, 7 cannot become dislodged inadvertently. Nevertheless, during assembly of the folding curtain, the cords 6, 7 can easily be introduced into the opening 17 before the rod 13 are introduced into the sockets 16. After the cord is lodged in the opening 17, it can immediately be secured in place by positioning the socket 16 over a part of a rod 13, so the passage 18 is closed off.

The cords 6, 7 can also be removed easily from the opening 17 by removing the socket 16 from the rod 13. This is particularly useful if it is desired to remove the web for replacement or cleaning purposes.

Assembling the cords 6, 7, the rods 13 and the devices 14 is particularly simplified, because the cords 6, 7 only have to be passed into corresponding openings 17 and are automatically secured in place when the sockets 16 are mounted over the rods 13.

As the connecting devices 14 are mounted, in a single operation, firstly, the rods 13 are positioned relative to the web 1 by sandwiching a part of the web 1 between the rod 13 and the socket 16 at each connecting device 14, and, secondly, the cords 6, 7 are guided relative to the rods 13 and the web 1. The rods 13 are entirely enclosed in loops 12 of the web 1, so the rods 13 as such are not visible from either side of the web 1. Consequently, also at the side where the cords 6, 7 are suspended along the web 1 - which side generally faces outdoors when the curtain is in its position for use - the rods 13 do not disturb the appearance of the curtain. The only parts provided in front of the web 1 at this side are the connecting devices 14 which may be made of transparent material and the cords 6, 7 which may be of a very small diameter and of a colour adapted to the design of the web material.

The sockets 16 of the connecting devices 14 are each bounded by flexible legs 20 having free ends. This brings about the advantage that the connecting devices 14 can simply be clipped over the rods 13 and the loops 12 of web material enclosing the rods 13 in a direction transverse to the axis of the respective rod 13. At each mounted connecting device 14 a part of a loop 12 of the web 1 enclosing the respective rod 13 is sandwiched between the legs 20 and the rod 13 fixing the rod 13, the web material and the connecting device 14 to each other.

Also if the connecting device is to be mounted over a profile without sandwiching a layer of material between the socket and the part of the profile within the socket, it is advantageous if the socket is bounded by at least one flexible leg with a free end, because generally it is easier to clip a device over the profile than to pass the connecting device over the profile in longitudinal direction of the profile. Moreover, passing a connecting device with a circumferentially closed socket over a profile in longitudinal direction of that profile is even impossible, if structures extend transversely from that profile.

In each of the shown connecting devices 14, the passage 18 traverses the socket 16. This further facilitates introduction of a cord 6, 7 into the opening 17 in particular in combination with clipping the connecting device 14 over a profile in a direction transversely to the longitudinal direction of that profile. The passage 18 traversing the socket 16 partitions the socket 16 in two, the socket parts

being connected only by a part of the body extending along the opening. Nevertheless, this does not result in an unacceptable reduction of the stability of the connecting device, because after the device 14 is mounted to a profile, the parts of the socket 16 on either side of the passage 18 are mutually kept in line by that profile.

For some applications it may be advantageous if the passage intersects only a small part, for example a corner, of the socket or has a curved trajectory (e.g. U-shaped or L-shaped).

Each of the connecting devices 14 shown in the Figs. 1-4, 6 and 7 has two pairs of flexible legs 20 bounding opposite sides of the socket 16 and having fixed ends at a common side of the socket 16. The openings 17 are each located at the same side of the socket 16 as the fixed ends of the legs 20 and the each passage 18 traverses the socket from the free ends of the legs 20 to the fixed ends of the legs 20. These connecting devices 14 can be mounted in a very simple manner by positioning the cord transversely over the profile with respect to which it is to be guided or to which it is to be connected and passing the connecting device 14 over the profile in a direction transversely to the profile and the cord. As the connecting device 14 is clipped over the profile, simultaneously the cord is passed sideways through the passage towards the opening and secured against dislodgement as soon as the profile has snapped in place in the socket 16.

The connecting device 14 shown in the Figs. 1-4 and 7 are each provided with two openings 17. As appears from Fig. 7, this provides the possibility to guide an additional cord 21 relative to a profile without interference with the cord 6 for pulling up and lowering the curtain. This additional cord 21 may for example be provided with stoppers 22 for keeping the connecting device in a predetermined position along the cord 21. To obtain a folding curtain of which the web portions between the rods 13 form suspended loops if the curtain is in its lowered position, the pairs of stoppers 22 associated with subsequent connecting devices can be positioned with a spacing substantially smaller than the spacing between subsequent rods 13 enclosed in the web 1. instead of two stoppers 22 at each connecting device, it is also possible to provide stoppers only under each position for a connecting device.

If the connecting device is provided with two openings 17 for holding a cord 6, 7, 21, each of these openings preferably communicates with a separate, associated passage or passage branch extending at least until the socket as is shown in Figs. 1-3 and 7. This arrangement precludes the cords from reaching the other cord or the other opening 17 if dislodged from the respective open-

ing 17, because no passage from one opening 17 to the other is available if the profile is in place in the socket 16.

In the connecting devices shown in Figs. 1-3, a partition 24 between said passage branches 19 extends only until a projected boundary of the socket 16. This simplifies the design of the connecting device, because only two socket parts have to be formed. Also passing cords 6, 7, 21 into the openings 17 is facilitated. The cords can be passed into the common part of the passage 18 and subsequently be pulled apart as the cords are passed further towards the openings 17, so each cord is guided along an outside of the passage 18 into one of the branches 19 of the passage 18 and further towards the respective openings 17.

In each of the shown connecting devices, the opening 17 has a width larger than the width of a part of the passage 18 adjoining the opening 17, so the cords 6, 7, 21 will tend to stay in the openings 17. If the material of the body is sufficiently flexible and the cords are sufficiently thin, the passage may be provided in form of a slit with contacting opposite walls which may be urged apart to allow passage of a cord into or out of the opening.

The connecting device 14 shown in Fig. 5 is adapted to be mounted to an end of a rod. The socket 16 is provided in form of a bore with a closed end 23 into which an end of the rod can be introduced in longitudinal direction. The circumferential walls of the socket completely enclose the bore except where the bore is intersected by the passage 18. If the connecting devices as shown in Fig. 5 are attached to opposite ends of a rod extending from a loop in a web as shown in Fig. 1, the rod is axially retained in the loop in the web.

Claims

1. A device for connecting a profile (13) to a cord (6, 7, 21), said device comprising a body (15), said body (15) bounding a socket (16) for holding a part of a profile (13), an opening (17) for holding a cord (6, 7, 21), and a passage (18) communicating with the opening (17) for sideways entering a cord (6, 7, 21) into the opening (17), **characterized in that** the passage (18) intersects the socket (16).
2. A device according to claim 1, wherein the passage (18) traverses the socket (16).
3. A device according to claim 1 or 2, wherein the socket (16) is bounded by at least one flexible leg (20) with a free end.
4. A device according to claim 3, wherein at least two flexible legs (20) bound opposite sides of

the socket (16) and have fixed ends at a common side of the socket (16), the opening (17) being located at the same side of the socket (16) as the fixed ends of the legs and the passage (18) traversing the socket (16) from the free ends of the legs to the fixed ends of the legs (20). 5

5. A device according to any one of the preceding claims, comprising at least two openings (17) for holding a cord (6, 7, 21), each of said openings (17) communicating with a separate, associated passage (18) or passage branch (19) extending at least until the socket (16). 10

6. A device according to claim 5, wherein a partition (24) between said passage branches (19) extends until a projected boundary of the socket (16). 15

7. A device according to any one of the preceding claims, wherein the socket (16) is a hollow profile-shaped space. 20

8. A device according to any one of the preceding claims, wherein the opening (17) has a width larger than the width of a part of the passage (18) adjoining the opening (17). 25

9. A folding curtain comprising a vertically suspended web (1) provided with at least one loop (12) enclosing a horizontal profile (13), cords (6, 7, 21) vertically suspended along said web (1) and connecting devices (14) mounted to said profiles (13) where said cords (6, 7, 21) pass at least one of said profiles (13), each of said connecting devices (14) comprising a body (15), said body (15) bounding a socket (16) in which a part of the respective profile (13) is lodged and held, an opening (17) through which a respective one of said cords (6, 7, 21) extends and a passage (18) communicating with the opening (17) for sideways entering a cord (6, 7, 21) into the opening (17), said passage (18) being obstructed by the profile (13). 30 35 40 45

10. A folding curtain according to claim 9, wherein sockets (16) of at least some of said devices are each bounded by flexible legs (20) having free ends, a part of a loop (12) of the web enclosing the respective profile (13) being sandwiched between said legs (20) and said profile (13). 50

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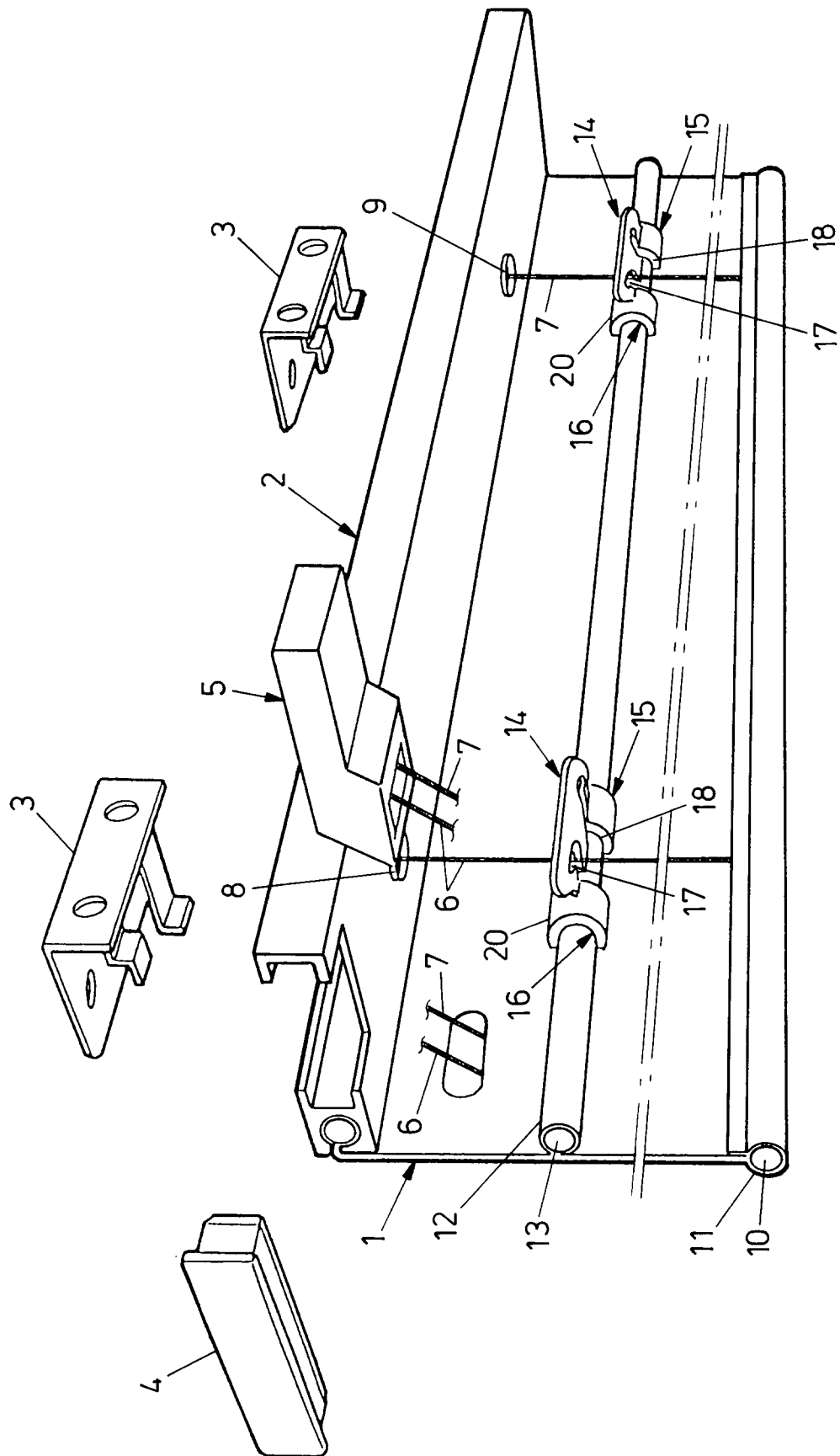


FIG.1

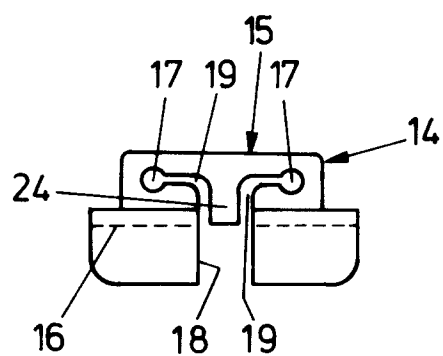


FIG. 2

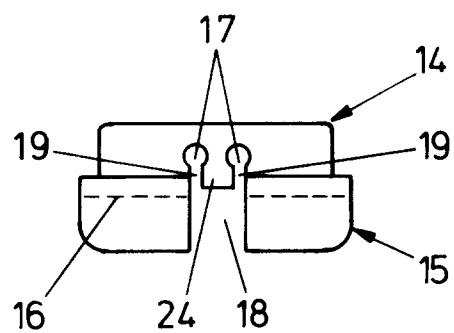


FIG. 3

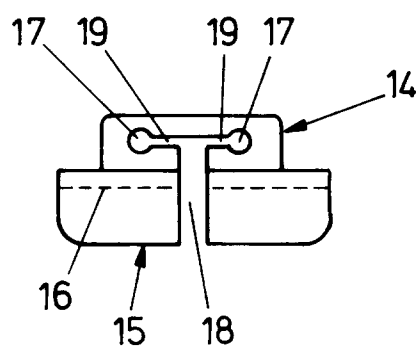


FIG. 4

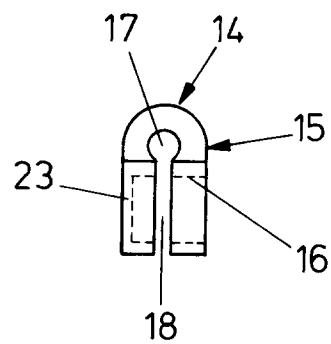


FIG. 5

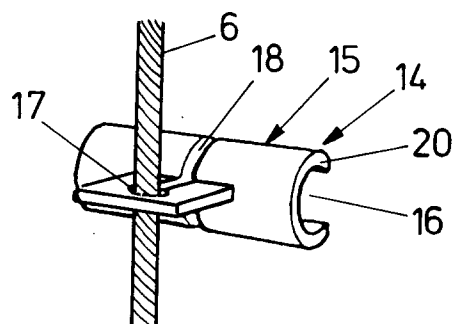


FIG. 6

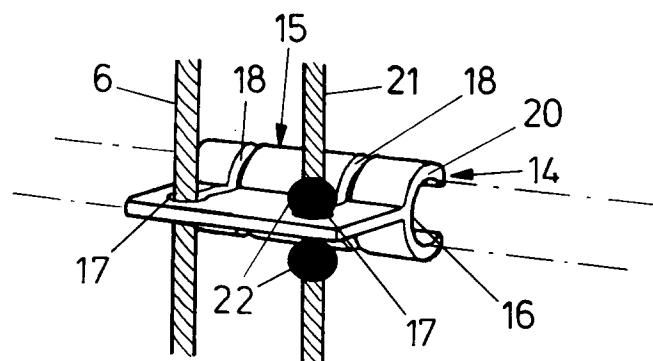


FIG. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 94 20 1430

| 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.6) |
| A | GB-A-2 246 593 (THOMSEN) * page 7, line 13 - page 9, line 2; figures 3-5 * | 1 | E06B9/262 |
| A | DE-A-36 31 919 (GARDINIA VORHANGSCHIENEFABRIK KLEIN & WAELDER GMBH & CO KG) * column 10, line 58 - column 11, line 12; figure 18 * | 1 | |
| A | EP-A-0 501 881 (KRAEMER) * column 4, line 9 - line 45; figures * | 1 | |
| D,A | EP-A-0 366 917 (OPHUELS) * the whole document * | 1 | |
| | | | TECHNICAL FIELDS SEARCHED (Int.Cl.6) |
| | | | E06B |
| The present search report has been drawn up for all claims | | | |
| Place of search | | Date of completion of the search | Examiner |
| THE HAGUE | | 13 September 1994 | Kukidis, S |
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