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(11) **EP 0 915 214 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
12.05.1999 Bulletin 1999/19

(51) Int. Cl.⁶: **E04F 10/06**

(21) Application number: **98203636.0**

(22) Date of filing: **27.10.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **04.11.1997 NL 1007445**

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(54) **Sun blind with locking device**

(57) A sun blind comprising winding shaft, web of material (1), bottom frame (2) with guide blocks (3) and side guides (4) of a design which is known per se is provided, according to the invention, with a locking device (9) which is actuated by the guide blocks and comprises a resilient locking member (10) and a resilient operating member (11), a guide block (3), during movement from an initial position with the web of material wound up, in a first direction of movement, moving past the locking member (10) via a first pass-through position of the locking device (9) and being locked in a locking position, and the guide block (3), in order to release the locking, initially being moved further in the said first direction of movement to beyond the operating member (11) into an unlocked position, and then the block (3) being moved, in the opposite direction to the first direction of movement, via a second pass-through position of the locking device, the guide block (3) actuating the operating member (11), in such a manner that the operating member (11) moves the locking member (10) out of the path of the guide block (3) which is moving past.

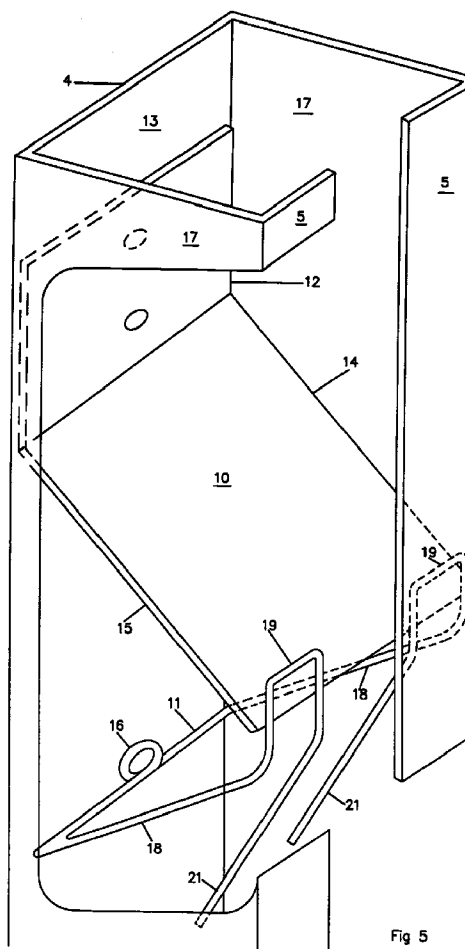


Fig 5

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Description

[0001] The invention relates to a sun blind having a fixed, rotatably mounted winding shaft for winding up and unwinding a web of material, one end of which web is fixed to the said winding shaft and the other end of which web is attached to a bottom frame, the bottom frame being displaceable, via guide blocks, in side guides which are disposed on both sides of an unwound web of material, and having a locking device in at least one of the said side guides for locking the web of material so that it is wind resistant, which locking device is actuated by displacement of the said guide blocks.

[0002] Such a sun blind with locking device is known, for example, from EP-A-0,315,036. This known sun blind is a lockable vertical screen. The web of material (or segments thereof, as in a Venetian blind screen) is attached on the underside to a bottom member and at the sides it runs in guide rails. Furthermore, a locking system is provided in order to lock the screen so that it is wind resistant. This known locking system comprises a projection which is attached to an arm and is arranged in a guide rail. Furthermore, a guide block which is guided through the guide rail is attached to both ends of the bottom member. In at least one block, a projection track is provided for the projection which is attached to an arm. When lowering the screen, the said projection passes into the projection track, which projection track is provided with a shape (comparable to an asymmetrical heart shape) which is such that the projection reaches the highest point in, for example, the left-hand portion of this heart shape and thus the screen is unable to descend any further. By then pulling the screen back upwards slightly, the projection is guided towards a recess which is situated opposite the said highest point and is thus locked, holding the screen taut. If such a screen has to be moved upwards again, it is first allowed to descend, with the result that the projection is moved into the right-hand section of the said projection track, after which the screen can be pulled upwards, the projection running through the right-hand section of the projection track.

[0003] A drawback of this known locking device lies in the projection track which has to be arranged in the block. A block of this nature comprising a projection track is expensive to produce. Furthermore, the overall design of the locking device is relatively complicated.

[0004] The object of the present invention is to provide a sun blind with a wind-resistant locking device which is of simple design and the components of which can be produced relatively inexpensively.

[0005] According to the invention, the sun blind of the type described above is characterized in that the side guides comprise a box profile with a longitudinal groove, in which a guide block extends through the longitudinal groove and engages on the inner wall of the box profile of a side guide, and in that the locking device comprises a resilient locking member and a resilient operating

member, a guide block, during movement in a first direction of movement from a starting position with the web of material wound up, moving past the locking member via a first pass-through position of the locking device and being locked in a locking position, and the guide block, in order to release the locking, initially being moved further in the said first direction of movement, beyond the operating member, into an unlocked position, and then the block being moved, in the opposite direction to the first direction of movement, via a second pass-through position of the locking device, the guide block actuating the operating member in such a manner that the operating member moves the locking member out of the path of the guide block which is moving past.

[0006] In the sun blind according to the invention, which may be a so-called "screen", roller blind, roller shutter or combination thereof, with a manual or electric actuator which is known per se, the locking device comprises a resilient locking member and a resilient operating member. When the sun blind is being lowered from the at-rest position, the guide block, which is guided in a side guide, firstly comes into contact with the resilient locking member. The inherent weight of the bottom frame is sufficient to push the resilient locking member away, so that the guide block can pass through via the first pass-through position. As soon as the block has moved past the locking member, this member, owing to its spring action, resumes its original position, so that the block is prevented from moving back (i.e. in the opposite direction to the said first direction of movement) in the locking position. If necessary, a slight return movement may be permissible in order to pull the web of material taut. In order to release the locking, the sun blind is moved further downwards, so that the guide block also moves beyond the operating member. If the sun blind is then pulled upwards, the guide block comes into contact with the operating member, which is depressed away, counter to the spring action, by the block. In the process, the operating member engages on the locking member in such a way that the guide block can be guided beyond the locking device, via the second pass-through position. Such a design of the locking mechanism made from spring materials is simple and can be produced at much lower cost than the locking device described above having a projection guided in a projection track, in accordance with EP-A-0,315,036.

[0007] In order to lock the web of material on both sides so that it is wind resistant, a locking device according to the invention is preferably present in both side guides.

[0008] The block, which is guided in the side guide, has a shape which is such that, in the installed position, it engages on the inner wall of the side guide, since otherwise it could come out of the guide via the longitudinal groove. Advantageously, a guide block comprises a T-shaped projection, the top side pieces of which are situated in the side guide and the leg of which extends

through the longitudinal groove.

[0009] Furthermore, the locking device is advantageously designed in such a way that, in the said first pass-through position, the top side pieces of the T-shaped projection are situated between the locking member and the operating member, as seen in the longitudinal direction of the leg of the T-shaped projection.

[0010] In the second pass-through position, the top side pieces of the projection are situated between the wall of the longitudinal-groove side of the side guide and the operating member, as seen in the direction defined above.

[0011] In a preferred embodiment of the locking device, which is used in the sun blind according to the invention, the resilient locking member is a leaf spring (also referred to below as the top spring), one end of which is attached to the base side of the side guide and the other, free end of which, in the at-rest position, extends from the base side at an angle towards the longitudinal-groove side of the side guide, in the direction of the first direction of movement. A leaf spring of this nature can be produced and attached in the side guide in a simple and inexpensive manner. If desired, a reinforcement profile may be attached to the free end of the leaf spring, in order to counteract permanent deformation. This arrangement of the leaf spring allows simple passage of the guide block in the first pass-through position, in which the spring is depressed away by the guide block. In the locking position, the guide block runs up against the leaf spring, which has, by then, resumed its original position.

[0012] Advantageously, the operating member is a wire spring (also referred to below as the bottom spring), which is also attached to the base side of the side guide and a first leg of which, in the at-rest position, extends as far as the longitudinal-groove side of the side guide, in such a manner that the first leg is situated between the free end of the top spring and the longitudinal-groove side of the side guide. If desired, a recess may be provided in the side guide, in which recess a first leg of this nature is positioned, the free end of the top spring extending as far as the longitudinal-groove side in the vicinity of this recess.

[0013] Preferably, the wire spring comprises an operating surface which lies between the free end of the top spring and the longitudinal-groove side of the side guide, thus ensuring correct engagement between the resilient members during the second pass-through position.

[0014] Preferably, the wire spring furthermore comprises a second free leg which extends from the longitudinal-groove side of the side guide, in the first direction of movement, towards the base side of the side guide. The role of this second free leg is twofold. In the first pass-through position, the guide block comes into contact with one side of this leg of the bottom spring, so that it is pulled open counter to the action of the spring and presses the guide block toward the base side of the side

guide. This ensures that the guide block cannot move aside in the side guide within the play which is present, and the guide block is locked stably in the locking position by the locking member. This design also allows the guide block, in the second pass-through position, to actuate the operating member correctly by engaging thereon on the other side of the second free leg.

[0015] According to a further embodiment, the locking member and the operating member therefor are made from a single part.

[0016] The invention will be explained in more detail below with reference to the appended drawing, in which:

Fig. 1 shows the first pass-through position of an embodiment of a sun blind with a locking device according to the invention;

Fig. 2 shows the locking position of the embodiment illustrated in Fig. 1;

Fig. 3 shows the uncoupling position of the embodiment illustrated in Fig. 1;

Fig. 4 shows the second pass-through position of the embodiment illustrated in Fig. 1; and

Fig. 5 shows a diagrammatic, perspective view of the locking device in accordance with Fig. 1.

[0017] Fig. 1 shows part of an embodiment of the sun blind according to the invention, in the first pass-through position. The vertical sun blind comprises a web of material 1, in the case illustrated canvas, which is made from a single piece. However, the web of material may also comprise segments which are connected to one another. The top end of the web of material is attached to a fixed, rotatably mounted winding shaft (not shown), which is controlled by means of a standard electrical or manual actuator. The other end of the web of material 1 is fixed to a bottom profile 2. Guide blocks 3, which are guided inside guides 4, are attached to both sides of the bottom profile 2. For the sake of simplicity, Fig. 1 and the figures to be discussed below show only the left-hand side. The side guides 4 comprise a box profile which is provided, on the side 5 facing towards the web of material 1 (hereinafter longitudinal-groove side), with a longitudinal groove. In the embodiment illustrated, the guide block 3 comprises a T-shaped projection 6, the top side pieces 7 of which are situated in the side guide 4 and the leg 8 of which can move in the longitudinal groove. A locking device 9, which comprises a resilient locking member 10 and a resilient operating member 11, is disposed in the side guide 4.

[0018] The resilient locking member 10 is a leaf spring which at one end 12 is fixed to the base side 13 of the side guide 4 with the aid of suitable means, for example one or more screws. Adjacent to end 12, the leaf spring 10 comprises a part 14 which extends at an angle, from the base side 13, towards the longitudinal-groove side 5. In order to reinforce the leaf spring 10, a reinforcement profile 15 is used, in order to fit the end 12 between the base side 13 and the reinforcement profile

15, for example an aluminium plate. A similar profile 15 is attached to the part 14. The at-rest position is indicated by dashed lines. Beneath the leaf spring 10, the operating member 11 is attached to the base side 13 of the guide 4. In this embodiment, the operating member 11 is a wire spring, the design of which will be explained in more detail with reference, inter alia, to Fig. 5. The wire spring comprises a loop 16, with the aid of which the wire spring 11 is fixed in the side guide 4, for example by means of a screw. Furthermore, the wire spring 11 comprises sections 18 which run at an angle upwards, from the base side 13, towards the longitudinal-groove side 5, along the inner side walls 17 of the side guide 4, which sections merge into first free legs 19 which are positioned against the longitudinal-groove side 5 of the guide 4. Towards the inside with respect to the sections 18, the free legs 19 merge into second free legs 21, which extend back towards the base side 13 of the guide 4 and towards the loop 16, but at a slightly smaller angle than the sections 18 with respect to the longitudinal axis of the guide 4. In this way, it is ensured that the projection 6 will move past the bottom spring successfully, both from the locking position towards the uncoupling position and from the uncoupling position towards the initial position.

[0019] The locking device 9 operates as follows. With the web of material 1 rolled up, the leaf spring 10 and the wire spring 11 are situated in the initial position which is indicated by dashed lines. If the sun blind is then lowered, the projection 6 comes into contact with the leaf spring 10, specifically the part 14 thereof, and presses the part 14 aside, so that the projection 6 can move past. At the same time, the second limbs 21 of the wire spring 11 are pressed away and pulled open. In the figures, the directions of movement are indicated by arrows. When the projection 6 has moved past the leaf spring 10, the locking member 10 springs back, thus blocking the projection 6 from moving upwards. This locking position is illustrated in Fig. 2, in which the second legs 21 of the wire spring 11 are still in the pulled-open position, thus pressing the projection 6 sideways.

[0020] If the sun blind is to be raised, it is firstly necessary to release the locking. To do this, the screen is lowered further, so that the projection 6 also moves past the operating member 11. As a result, the springs 10 and 11 move back into the initial position, as can be seen from Fig. 3. If the screen is then moved upwards, the top side pieces 7 of the projection 6 engage on the second free legs 21 of the wire spring 11 and push them aside. The first legs 19 thus come away from the longitudinal-groove side 5 and in turn push the part 14 of the leaf spring 10 aside, so that the projection 6 can move past the locking device (cf. Fig. 4).

[0021] In order to clarify the design of the locking device, Fig. 5 shows a perspective view, partially in section. In this figure, identical components are denoted by identical reference numerals. For the sake of clarity, the projection is not illustrated.

[0022] It will be clear to the person skilled in the art that the sun blind according to the invention is not limited to the embodiment of the locking device which is illustrated in the figures. Numerous other forms of the resilient members may be considered. For example, another possible form is a locking device in which both members are produced from a single part.

Claims

1. Sun blind having a fixed, rotatably mounted winding shaft for winding up and unwinding a web of material (1), one end of which web is fixed to the said winding shaft and the other end of which web is attached to a bottom frame (2), the bottom frame (2) being displaceable, via guide blocks (3), in side guides (4) which are disposed on both sides of an unwound web of material, and having a locking device (9) in at least one of the said side guides (4) for locking the web of material (1) so that it is wind resistant, which locking device (9) is actuated by displacement of the said guide blocks (3), characterized in that the side guides (4) comprise a box profile with a longitudinal groove, in which a guide block (3) extends through the longitudinal groove and engages on the inner wall of the box profile of a side guide, and in that the locking device comprises a resilient locking member (10) and a resilient operating member (11), a guide block (3), during movement in a first direction of movement from a starting position with the web of material wound up, moving past the locking member (10) via a first pass-through position of the locking device (9) and being locked in a locking position, and the guide block (3), in order to release the locking, initially being moved further in the said first direction of movement beyond the operating member (11) into an unlocked position, and then the block (3) being moved, in the opposite direction to the first direction of movement, via a second pass-through position of the locking device (9), the guide block (3) actuating the operating member (11) in such a manner that the operating member (11) moves the locking member (11) out of the path of the guide block (3) which is moving past.
2. Sun blind according to claim 1, characterized in that a guide block (3) comprises a T-shaped projection (6), the top side pieces (7) of which are situated in a side guide (4) and the leg (8) of which extends through the longitudinal groove.
3. Sun blind according to claim 2, characterized in that, in the first pass-through position, the projection (6) is situated between the locking member (10) and the operating member (11), as seen in the longitudinal direction of the leg (8) of the projection (6).

4. Sun blind according to one of the preceding claims, characterized in that, in the second pass-through position, the projection (6) is situated between the inner wall (5) of a side guide (4) and the operating member (11), as seen in a longitudinal direction of the leg (8) of the projection (6). 5

5. Sun blind according to one of the preceding claims, characterized in that the resilient locking member (10) is a leaf spring, one end (12) of which is attached to the base side (13) of the side guide (4) and the other, free end (14) of which, in the at-rest position, extends from the base side (13) at an angle towards the longitudinal-groove side (5) of the side guide (4), in the direction of the first direction of movement. 10 15

6. Sun blind according to one of the preceding claims, characterized in that the operating member (11) is a wire spring, which is attached to the base side (13) of a side guide (4), and a first leg (19) of which, in the at-rest position, reaches as far as the longitudinal-groove side (5) at the location of the free end (14) of the top spring (10). 20 25

7. Sun blind according to one of the preceding claims, characterized in that the operating surface of the said wire spring lies between the free end (14) of the top spring (10) and the longitudinal-groove side (5) of the side guide (4). 30

8. Sun blind according to one of the preceding claims, characterized in that the bottom spring (11) comprises a second free leg (21) which extends, from the longitudinal-groove side (5) of the side guide (4), in the first direction of movement, towards the base side (13) of the guide (4). 35

9. Sun blind according to claim 8, characterized in that the second free leg (21) also extends towards the loop (16). 40

10. Sun blind according to claim 5, characterized in that a reinforcement profile (15) is provided on the free end (14) of the leaf spring. 45

11. Sun blind according to one of the preceding claims, characterized in that the locking member (10) and the operating member (11) therefor are made from a single part. 50

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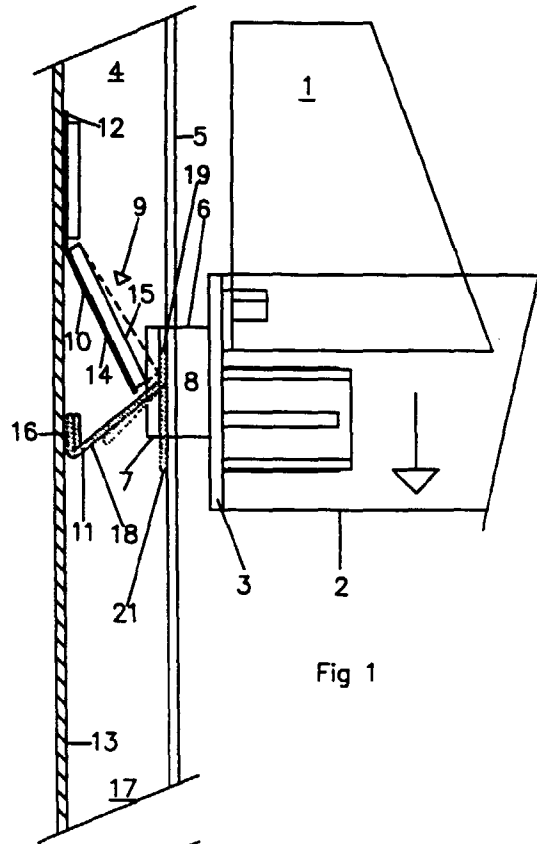


Fig 1

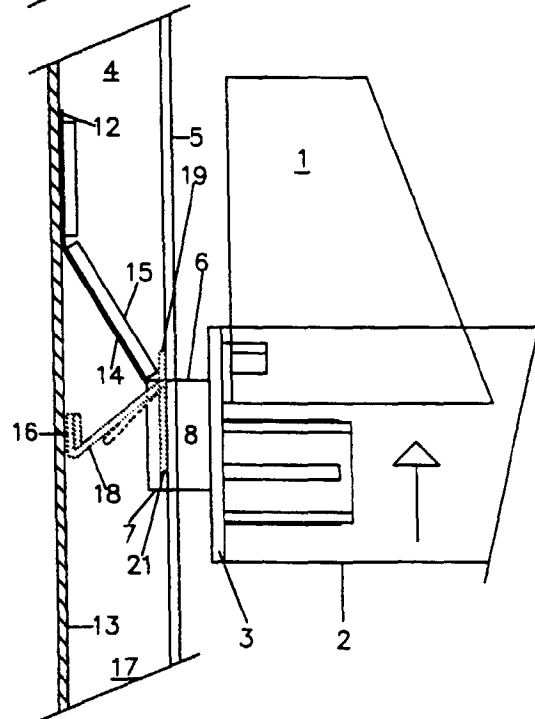
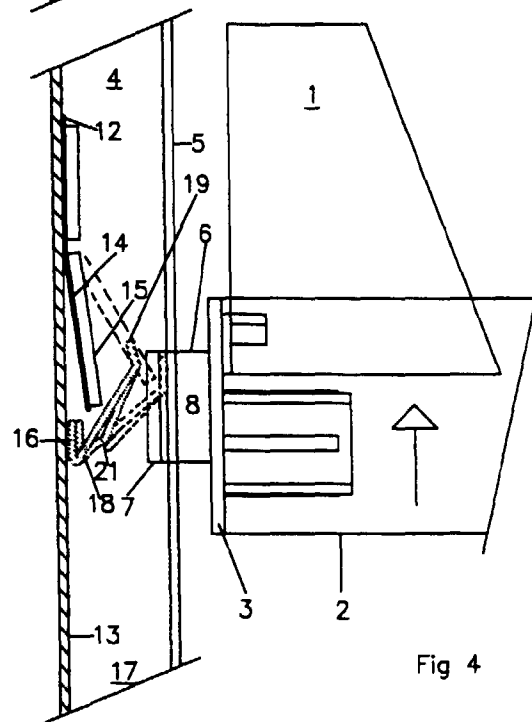
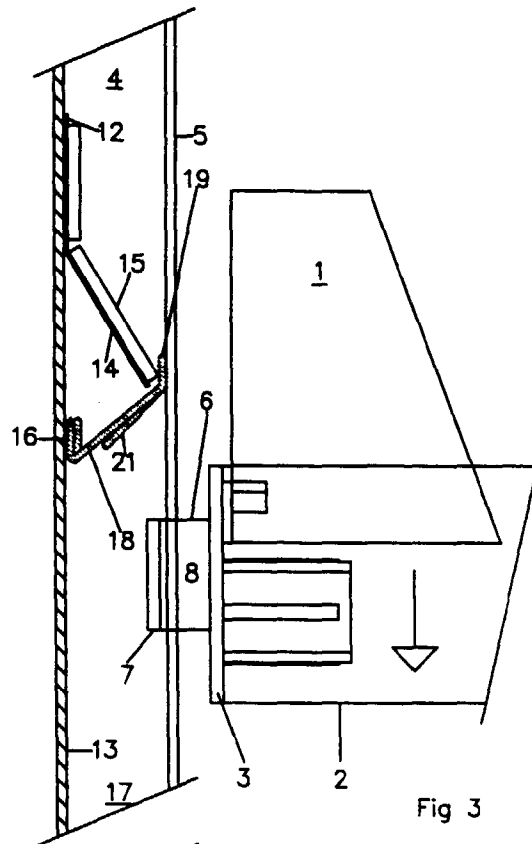


Fig 2



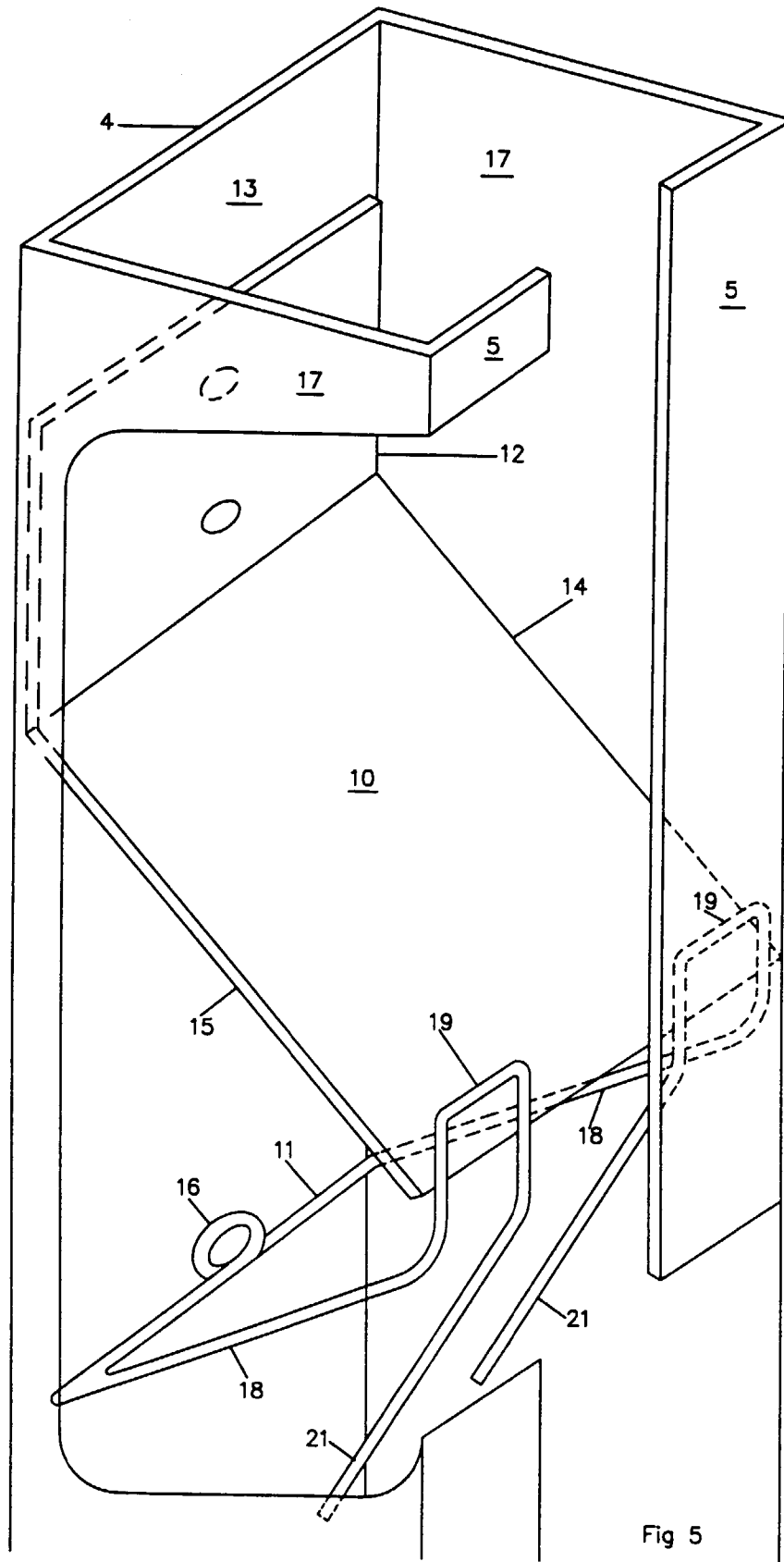


Fig 5



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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 3636

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 February 1999	Examiner Ayiter, J
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 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 98 20 3636

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-02-1999

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