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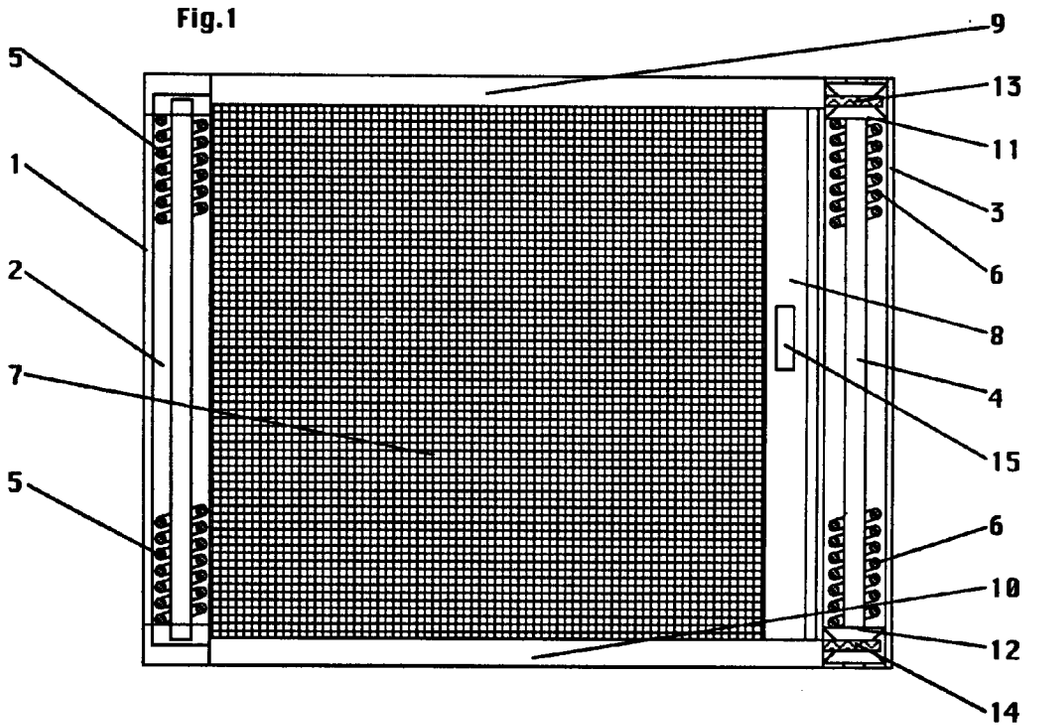
(54) Frame for a roller blind fitted with mechanisms capable of automatically closing the blind which protects a window or a french window

(57) A frame comprises a first roller shutter box (1) housing a take-up roller (2), and a second roller shutter box (3) wherein a shaft (4) turns; a first elastic mechanism (5) rotates the take-up roller (2), while a second elastic mechanism (6) rotates the shaft (4); the take-up roller (2) stretches a blind (7) which is drawn between the take-up roller (2) and a manoeuvring bar (8) sliding on two guides (9,10); two pulleys (11,12) are splined to the ends of the shaft (4) for manoeuvring two tie rods (13,14) connected to the manoeuvring bar (8); the tie rods (13,14) are located inside the respective guides (9,10) for transmitting the tensile stress of the second elastic mechanism (6) to the manoeuvring bar (8); this stress prevails on the stress of the first elastic mechanism (5), therefore the blind (7) closes the French window when only the stresses of both elastic mechanisms (5,6) are applied to the blind (7).

Fig.1



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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a frame for roller blinds fitted with mechanisms capable of automatically closing the blind immediately after its opening.
The frame and the mechanisms according to the present application are essentially used for manoeuvring a vertical blind protecting a room overlooking a veranda or a balcony. The flyscreens must remain closed for preventing the insects from passing from the veranda into the room; repeated opening and closing manoeuvres of a flyscreen are annoying; therefore, the present invention aims to create a flyscreen automatically closing the French window after its opening for stopping the insects which try to enter the room.

MAIN FEATURES OF THE INVENTION

[0002] The frame according to the invention comprises: a first roller shutter box which houses a vertical take-up roller for a blind, and a second roller shutter box in which a vertical shaft runs; a manoeuvring vertical bar sliding inside an upper guide and a lower guide; the manoeuvring bar is connected to the take-up roller by means of the blind and to the shaft by means of motion transmitting elements; in addition, the manoeuvring bar consists of two jointed and separable jambs; a first elastic mechanism, housed in the first roller shutter box, is used for rotating the take-up roller, and a second elastic mechanism, located in the second roller shutter box, is capable of rotating the shaft; the stresses of the second elastic mechanism prevail on the stresses of the first elastic mechanism transmitted to the manoeuvring bar by the blind, therefore, the blind closes the French window when only the stresses of both elastic mechanisms are applied to the blind; supporting means to constrain the upper guide to the frame, said supporting means allowing settling movements of the upper guide to maintain said upper guide parallel to the lower guide for each position of the manoeuvring bar relative to the ends of the guides.
[0003] The upper guide consists of two channels; an external channel houses an internal channel representing the real guide of the manoeuvring bar; the external channel is shaped like a reversed U defining a longitudinal opening wherein the guiding channel shaped like a reversed C with two symmetrical recesses is located, said recesses delimiting a longitudinal groove in which the manoeuvring bar can slide.
[0004] The guiding channel is free to vertically translate inside the longitudinal opening of the external channel to allow an easy displacement of the manoeuvring bar even in the case of an incorrect montage of the frame on an incorrectly levelled window opening.
[0005] The supporting means consist of brackets integral with covers protecting the take-up roller and the shaft; the guiding channel bears on said brackets by sliding freely.
[0006] At both ends of the upper guide a connecting element is provided consisting of a tube-like structure connected to a longitudinal slit; two brackets constrain the connecting element to the respective end of the internal guiding channel, the upper bracket is found over the rib of the guiding channel, while the lower bracket is located underneath; both brackets embracing the rib at the respective end of the guiding channel.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Other advantages, features and aims of the invention may be more readily understood by referring to the accompanying drawings, which concern a preferred embodiment, in which:

Fig.1 a frame with the flyscreen completely shut;
Fig.2 the frame of Fig.1 with the blind partially open;
Fig.3 the frame of Fig.1 with the blind completely open;
Fig.4 the frame of Fig.1 with the blind completely open and the two jambs of the manoeuvring bar of the blind set apart;
Fig.5 a longitudinal view of the upper guide wherein the blind and both jambs of the manoeuvring bar slide;
Fig.6 an orthogonal sectional view of the upper guide;
Fig.7 an orthogonal sectional view of the guide bearing channel;
Fig.8 an orthogonal sectional view of the guiding channel;
Fig.9 an orthogonal sectional view of an element connecting the guiding channel to the constraints supporting the frame;
Fig.10 a longitudinal sectional view of the guide bearing channel;
Fig.11 a longitudinal sectional view of the guiding channel;
Fig.12 a longitudinal sectional view of the connecting element of Fig.9;
Fig.13 an orthogonal sectional view of one of the upper guide ends;
Fig.14 a schematic view of the upper part of the take-up roller;
Fig.15 an orthogonal sectional view of the lower guide and the jamb of the manoeuvring bar supporting a running roller;
Fig.16 an orthogonal sectional view of the lower guide and of the jamb of the manoeuvring bar connected to the jamb of Fig.15;
Fig.17 a schematic longitudinal view of the elements of Figs 15 and 16;
Fig.18 a draft of the frame with the upper guide supported by two bearing constrains;
Fig.19 a draft of the frame with the upper guide sup-

ported by two bearing constrains, the former incorrectly assembled, therefore the two guides are not parallel;

Fig.20 the frame of Fig.19 with the upper guide disposed parallel to the lower guide consequent to the shifting of the manoeuvring bar;

Fig.21 a draft of the frame with the upper guide supported by two bearing constrains, the latter incorrectly assembled, therefore the two guides are not parallel; and

Fig.22 the frame of Fig.21 with the upper guide disposed parallel to the lower guide consequent to the shifting of the manoeuvring bar.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

[0008] The frame of Fig.1 comprises a first roller shutter box 1 which houses a vertical take-up roller 2 and a second roller shutter box 3 wherein a shaft 4 runs. A first elastic mechanism 5, housed in the first roller shutter box 1, is used for rotating the take-up roller 2, while a second elastic mechanism 6 inside the second roller shutter box 3 is capable of rotating the shaft 4.

[0009] The take-up roller 2, stressed by the elastic mechanism 5, stretches a blind 7 (mosquito net or sunscreen) capable of closing a French window; the blind 7 is drawn between the take-up roller 2 and a manoeuvring bar 8 kept in vertical position on two sliding guides 9, 10, respectively the upper and the lower one.

[0010] A pulley 11, (12) is splined to both ends of the shaft 4 for manoeuvring a respective flexible tie rod 13, (14), the free end of which is connected to the manoeuvring bar 8. The tie rods 13, 14 are located inside the respective guides 9, 10, for transmitting the tensile stress of the second elastic mechanism 6 to the manoeuvring bar 8; this stress prevails on the stress of the first elastic mechanism 5 transmitted to the bar 8 by the blind 7, therefore the blind 7 closes the French window when only the stresses of both elastic mechanisms 5, 6 are applied to the blind 7.

[0011] In Fig.2 the blind 7 is partially open as a consequence of a shifting to the left of the manoeuvring bar 8 due to an external force (i. e. a hand) applied to a handle 15 of the bar 8.

[0012] In Fig.3 the blind 7 is completely open as a consequence of a further shifting to the left of the manoeuvring bar 8 due to an external force applied to the handle 15 of the bar 8. In this Figure the guides 9, 10 are shown to highlight the positions of the bar 8 and the tie rods 13, 14.

[0013] The stress shifting the manoeuvring bar 8 to the left is stronger than the one of the second elastic mechanism 6 because it must overcome the tensile stress of the tie rods 13, 14 which acts on the bar 8. The rolling of the blind 7 over the take-up roller 2 is effected by the first elastic mechanism 5, which stretches the blind 7 as it shifts to the left or to the right.

[0014] When the configuration of Fig.3 is reached, the bar 8 is released for automatically restoring the position of Fig.1 of the blind 7 and the bar 8; in fact the second elastic mechanism 6 prevails on the first elastic mechanism 5 in order to automatically shut the French window.

[0015] As shown in Fig.4, the manoeuvring bar 8 consists of two separate jambs 16, 17, which can be connected to each other by means of a known structure (latch or the like); therefore, the jamb 16 connected to the blind 7 can be separated from the jamb 17 on which the tie rods 13, 14 act.

[0016] By means of this configuration of the manoeuvring bar 8 it is possible to maintain the French window open to allow a piece of furniture or other cumbersome item to pass through. It is evident that when the jambs 16, 17 are separate, the blind 7 is completely rolled over the take-up roller 2 because of no stress opposing the rolling stress of the first mechanism 5; therefore, the tie rods 13, 14 are completely rolled over the respective pulleys 11, 12 as no stress opposes the stress of the second elastic mechanism 6.

[0017] The upper guide 9 (Fig.5) consists of two channels 18, 19; an external channel 18 houses an internal channel 19 representing the real guide of the manoeuvring bar 8; for better understanding the position of both jambs 16, 17 forming the manoeuvring bar 8 shown in this Figure, a section is practiced in connection with said position. The blind 7 is constrained by the jamb 16, while the tie rod 13 (14) is jointed to the jamb 17; both jambs 16, 17 of the bar 8 slide inside the channel 19; the blind 7 is stretched by the take-up roller 2.

[0018] The manoeuvring bar 8 and the channels 18, 19 are also shown in Fig.6; this Figure confirms what disclosed previously.

[0019] The external channel 18 (Figs 7, 10) is essentially shaped like a reversed U wherein the guiding channel shaped like a reversed C with two symmetrical recesses 20,21 is located (Figs 8, 11), said recesses defining a longitudinal groove 22 in which the manoeuvring bar 8 slides. The longitudinal groove 22 occupies the whole length of the guiding channel 19.

[0020] At both ends of the upper guide 9 a connecting element 23 (Figs 9, 12) is provided consisting of a tube-like structure 24 connected to a longitudinal slit 25; two brackets 26, 27 constrain the connecting element 23 to the respective end of the internal guiding channel 19. The upper bracket 26 is found over the rib 28 of the internal guiding channel 19, while the lower bracket 27 is located underneath; the two brackets 26, 27 embracing the rib 28 at the respective end of the guiding channel 19.

[0021] Figs 13, 14 show the upper guide 9 and the upper part of the take-up roller 2; the scales of these Figures have been chosen in order to highlight the configuration of the illustrated mechanical elements, therefore they are not necessarily faithful to the actual dimensions of said elements. The upper guide 9 is connected to an external housing 29 of the roller shutter

box 1 (3); in particular, the external channel 18 is fastened to a cap 30 closing the upper part of the roller shutter box 1 (3). The cap 30 presents a supporting rod 31 on which the external channel 18 of the upper guide 9 rests; a cover 32 protecting the take-up roller 2 (and the shaft 4) is fitted with a bracket 33 forming the sliding bearing of the tube 24 of the connecting element 23. In Fig.14 the bracket 33 does not bear the connecting element 23.

[0022] At both ends of the upper guide 9 the longitudinal opening 34 of the external channel 18 houses one connecting element 23 connected to the internal guiding channel 19; the channel 19 is free to vertically translate together with the connecting elements 23 inside the longitudinal opening 34 to allow easy translations of the manoeuvring bar 8.

[0023] Figs 15, 16, 17 schematically show the jambs 16, 17 of the manoeuvring bar 8, the lower guide 10, the blind 7 and the lower tie rod 14. The jamb 16 presents a housing 35 for a roller 36 rotating around a shaft 37 supported by the walls of the housing 35; the roller 36 has an arched shape 38, the radius of curvature of which is equal to the radius of curvature of the upper edge 39 of the lower guide 10. An internal longitudinal groove 42 occupies the whole length of the rail like lower guide 10; the reversed T groove 42 houses a slide 40 integral with the jamb 16; the slide 40 presents a configuration analogous to that of the groove 42 for preventing the slide 40 from coming out of the groove 42 during translations of the bar 8. The slide 40 is located at the end of the jamb 16 which can be connected to the jamb 17 by means of a latch.

[0024] The jamb 17 of the manoeuvring bar 8 has a longitudinal dimension smaller than the longitudinal dimension of the jamb 16; in addition, it presents a frontal slide 41 fitted with brushes which slide on the guide 10; the frontal slide 41 has a radius of curvature equal to the radius of curvature Of the upper edge 39 of the lover guide 10.

[0025] The jamb 16 is stressed by the blind 7, while the jamb 17 is stretched by the tie rods 13, 14.

[0026] Figs 18, 19, 20 show how the upper guide 19 works in case the frame is not duly mounted or protects a French window with an incorrectly levelled cornice.

[0027] If duly mounted in a correctly levelled window (o French window), the frame is set as in Fig.18; the upper guide 19 is supported by two supporting brackets 33a, 33b for any position of the manoeuvring bar 8 with respect to the ends of the guides 10, 19. Therefore, the supporting brackets 33a, 33b (Fig.14) keep the upper guide 19 parallel to the lower guide 10, while the manoeuvring bar 8 can easily slide in both translation directions to open or close the room protected by the blind 7. In this condition the upper guide 19 is constrained by both supporting brackets 33a, 33b like a beam.

[0028] If the constraints of the guides 19 are stiff and the frame is incorrectly mounted or is found in an incorrectly levelled window, the guides 10 and 19 will not be parallel and the manoeuvring bar 8 will not be capable of sliding.

[0029] According to the invention the guiding channel 19 is free to vertically translate together with the connecting elements 23 inside the longitudinal opening 34 of the external channel 18; this feature allows an easy displacing of the manoeuvring bar 8 even in case of incorrect mounting of the frame on an incorrectly levelled cornice.

[0030] If the bracket 33a (Figs 19, 20) is mounted lower than due, the displacement of the manoeuvring bar 8 to the opening position of the blind causes a relative rising of the upper guide 19 with respect to the lower guide 10; on the contrary, if the bracket 33b (Figs 21, 22) is mounted lower than due, the displacement of the manoeuvring bar 8 to the closing position causes a relative rising of the upper guide 19 with respect to the lower guide 10; both displacements allow the upper guide 19 to set parallel to the lower guide 10.

[0031] In a not shown embodiment the external channel 18 is constrained to a structure external to the frame (for example, a wall) in correspondence with the same by means of fixing means (i. e. screws, nails, brackets, etc.).

Claims

1. Frame for a roller blind fitted with mechanisms capable of automatically closing the blind which protects a window or a French window, comprising:

   a first roller shutter box (1) housing a take-up roller (2) for a blind (7) and a second roller shutter box (3) in which a shaft (4) turns;
   a vertical manoeuvring bar (8) sliding inside an upper guide (9) and a lower guide (10); the manoeuvring bar (8) being connected to the take-up roller (2) by means of the blind (7) and to the shaft (4) through elements transmitting the movement (11,12,13,14); the manoeuvring bar (8) further consisting of two united and separable jambs (16,17);
   a first elastic mechanism (5), housed in the first roller shutter box (1), is used for rotating the take-up roller (2), and a second elastic mechanism (6), located in the second roller shutter box (3), is capable of rotating the shaft (4); the stresses of the second elastic mechanism (6) prevail on the stresses of the first elastic mechanism (5) transmitted to the manoeuvring bar (8) by the blind (7), therefore the blind (7) closes the French window when only the stresses of both elastic mechanisms (5,6) are applied to the blind (7);
   supporting means (33a,33b) to constrain the upper guide (9) to the frame, said supporting means (33a,33b) settling movements of the

upper guide (9) to maintain said upper guide (9) parallel to the lower guide (10) for each position of the manoeuvring bar (8) relative to the ends of both guides (9,10).

2. Frame as in claim 1, wherein the upper guide (9) consists of two channels (18,19); an external channel (18) houses an internal channel (19) representing the real guide of the manoeuvring bar (8); the external channel (18) is shaped like a reversed U defining a longitudinal opening (34); inside the opening (34) the guiding channel (19) shaped like a reversed C with two symmetrical recesses (20,21) is located, said recesses (20,21) delimiting a longitudinal groove (22) in which the manoeuvring bar (8) can slide.

3. Frame as in claim 2, wherein the guiding channel (19) is free to vertically translate inside the longitudinal opening (34) of the external channel (18) to allow an easy displacement of the manoeuvring bar (8) even in the case of an incorrect montage of the frame on an incorrectly levelled window opening.

4. Frame as in claim 1, wherein the supporting means (33a,33b) consist of brackets (33) integral with covers (32) which protect the take-up roller (2) and the shaft (4), the guiding channel (19) freely resting on said brackets (33).

5. Frame as in claim 4, wherein two respective connecting elements (23) are provided at both ends of the upper guide (9), each of said connecting elements consisting of a tube-like structure (24) connected to a longitudinal slit (25); two brackets (26,27) constrain the connecting element (23) to the respective end of the internal guiding channel (19), the upper bracket (26) is found over the rib (28) of the guiding channel (19), while the lower bracket (27) is located underneath; the two brackets (26,27) embracing the rib (28) at the respective end of the guiding channel (19).

6. Frame as in claims 4 and 5, wherein the brackets (33) freely support the connecting elements (23).

7. Frame as in claim 1, wherein the lower guide (10) presents a longitudinal internal groove (42) capable of housing a slide (40) integral with a first jamb (16) of the manoeuvring bar (8) connected to the blind (7), the slide (40) presenting a configuration analogous to that of the groove (42) for preventing the slide (40) from coming out of the groove (42) during translations of the bar (8).

8. Frame as in claim 7, wherein said first jamb (16) presents a housing (35) for a roller (36) having an arched shape (38), the radius of curvature of which is equal to the radius of curvature of the upper edge (39) of the lower guide (10).

9. Frame as in claim 7, wherein the jamb (17) of the manoeuvring bar (8) connected to the shaft (4) presents a frontal slide (41) fitted with brushes, said frontal slide (41) sliding on the lower guide (10); said frontal slide (41) further presenting a radius of curvature equal to the radius of curvature of the upper edge (39) of the lower guide (10).

10. Frame as in claim 1, wherein the jamb (17) of the manoeuvring bar (8) connected to the shaft (4) has a longitudinal dimension smaller than the longitudinal dimension of the jamb (16) connected to the blind (7).

Fig.1

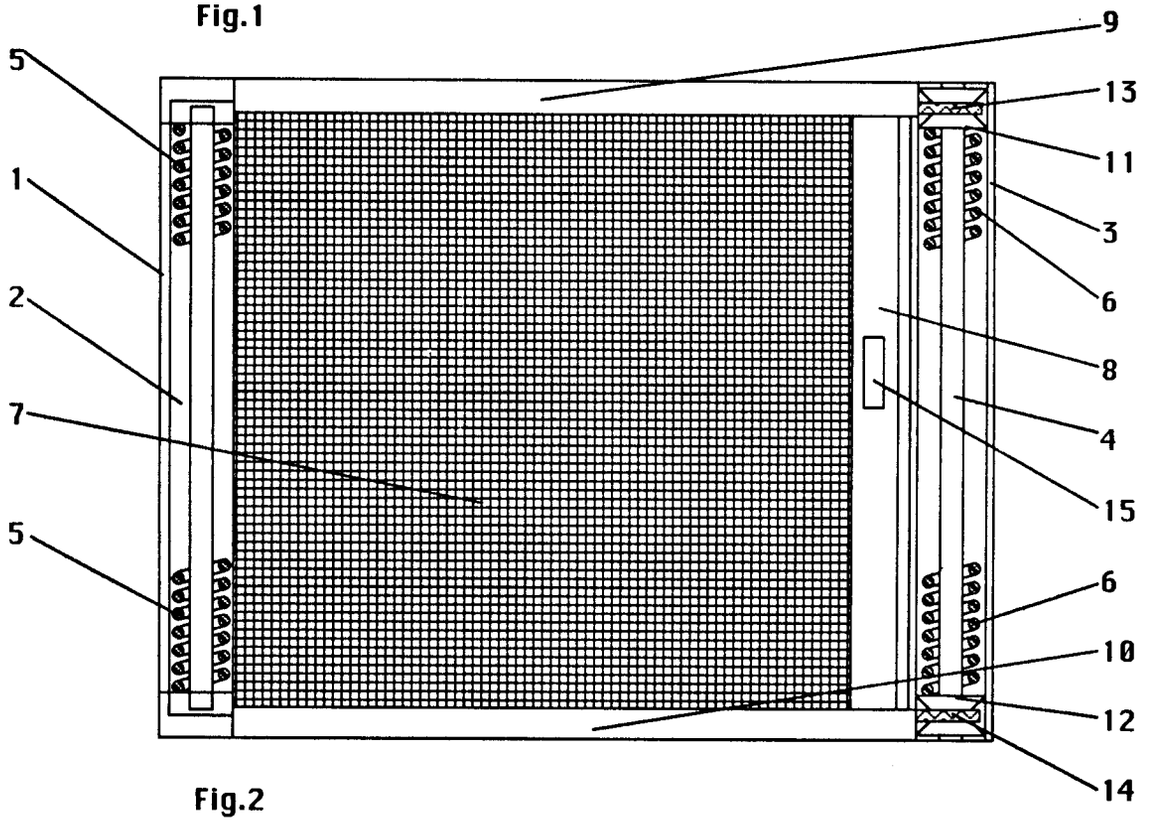


Fig.2

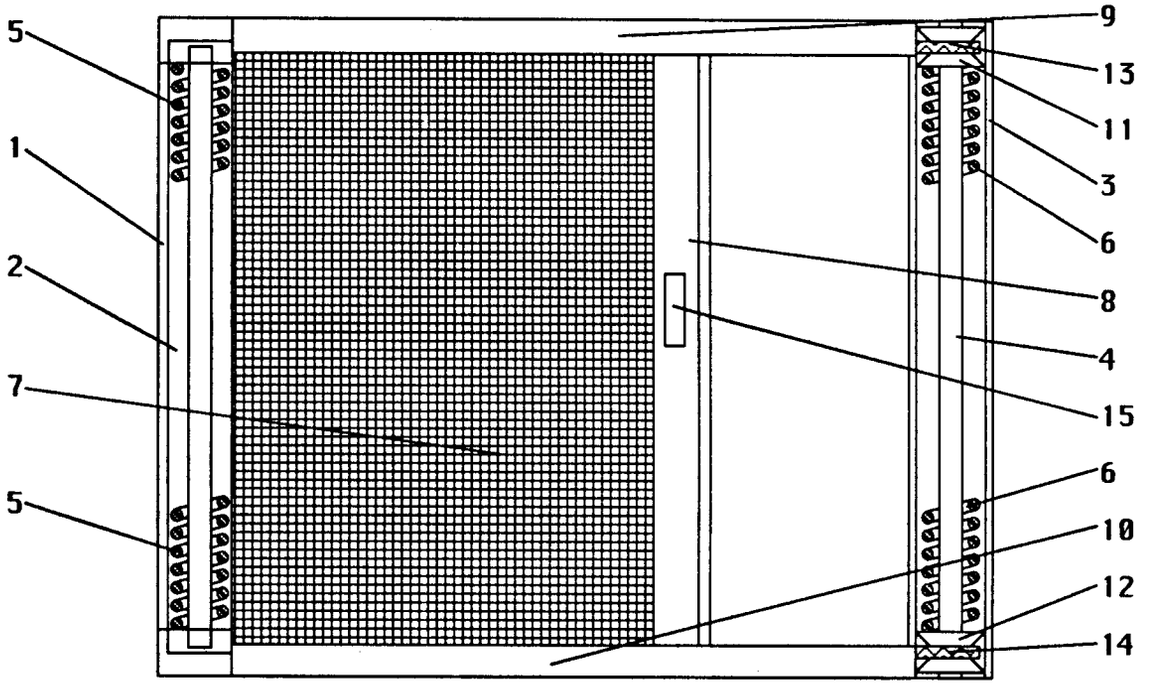


Fig.3

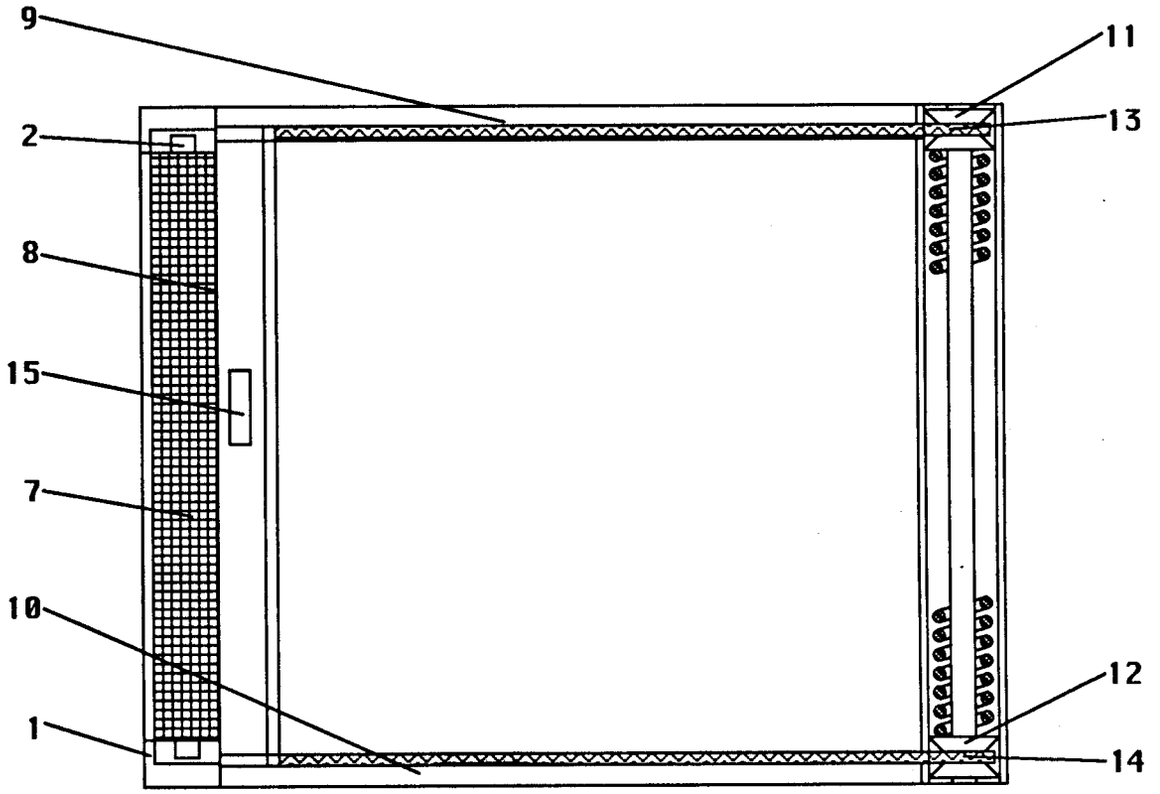


Fig.4

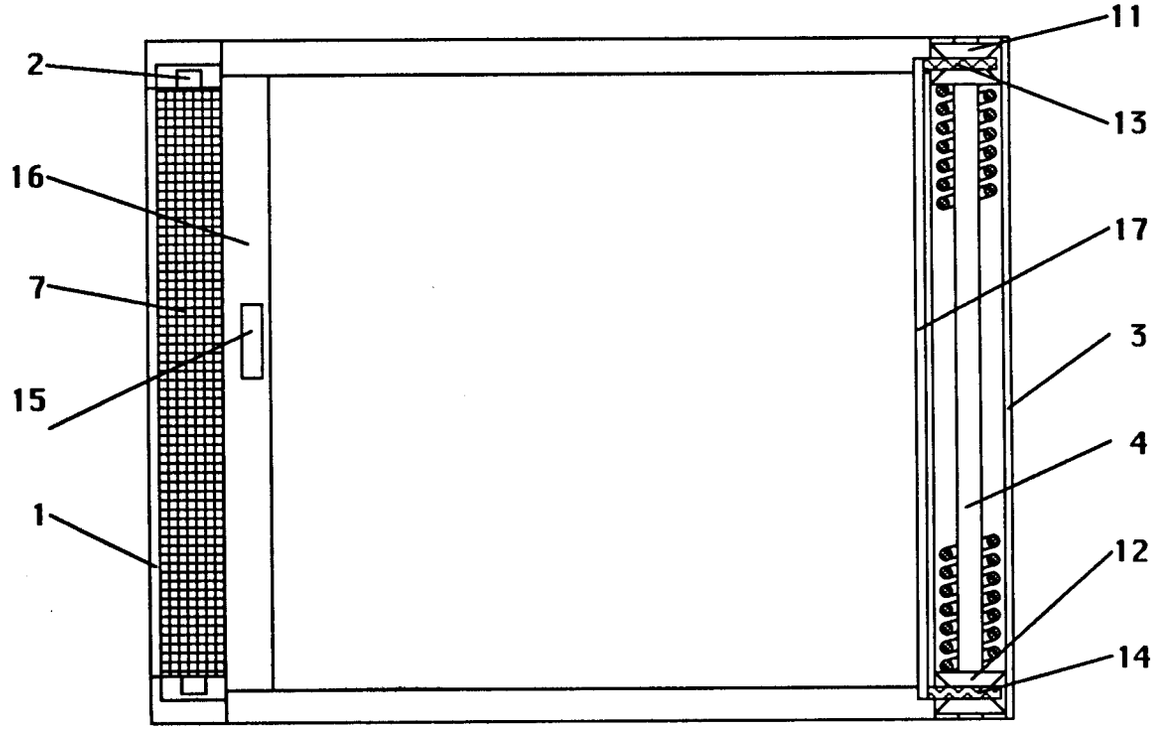


Fig.5

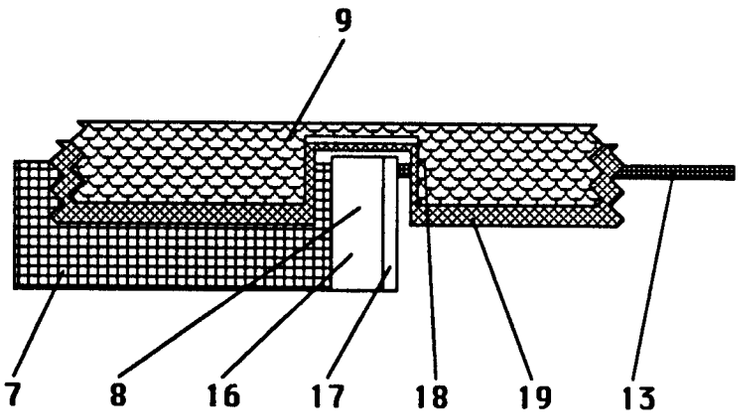


Fig.6

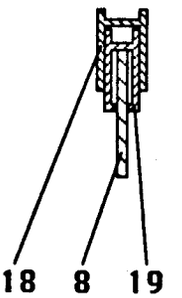


Fig.7

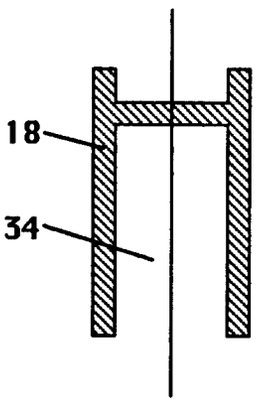


Fig.8

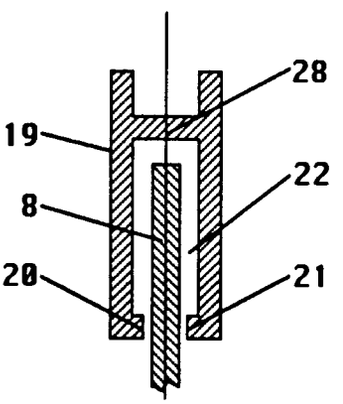


Fig.9

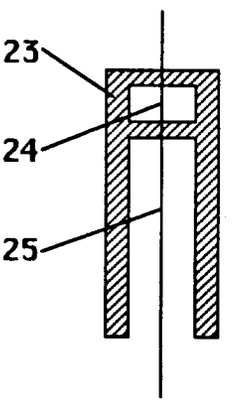


Fig.10

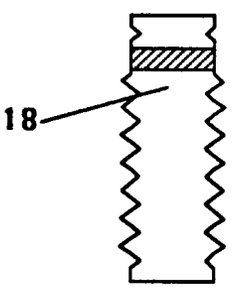


Fig.11

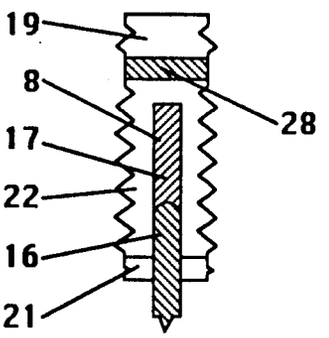


Fig.12

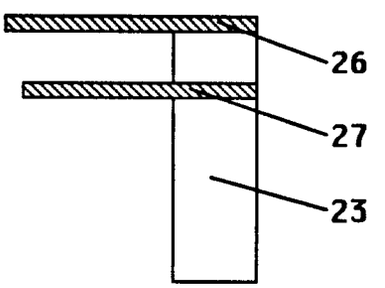


Fig.13

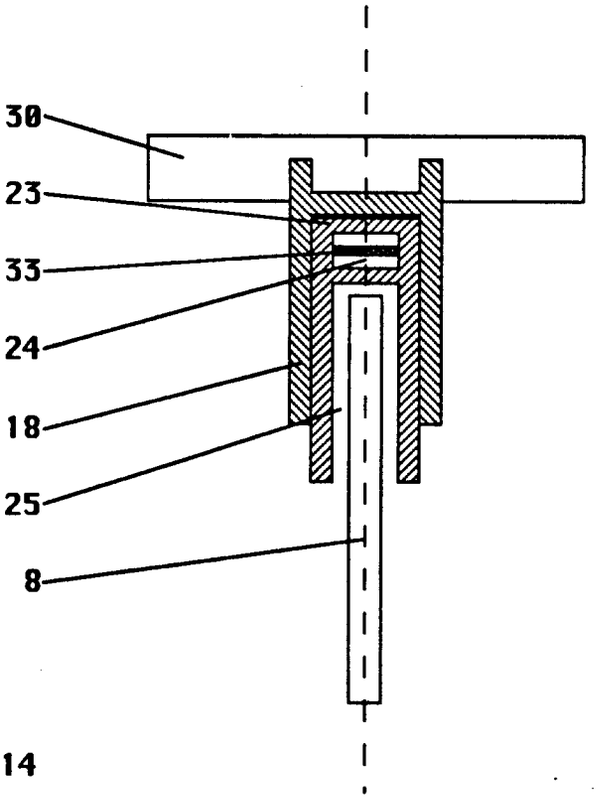


Fig.14

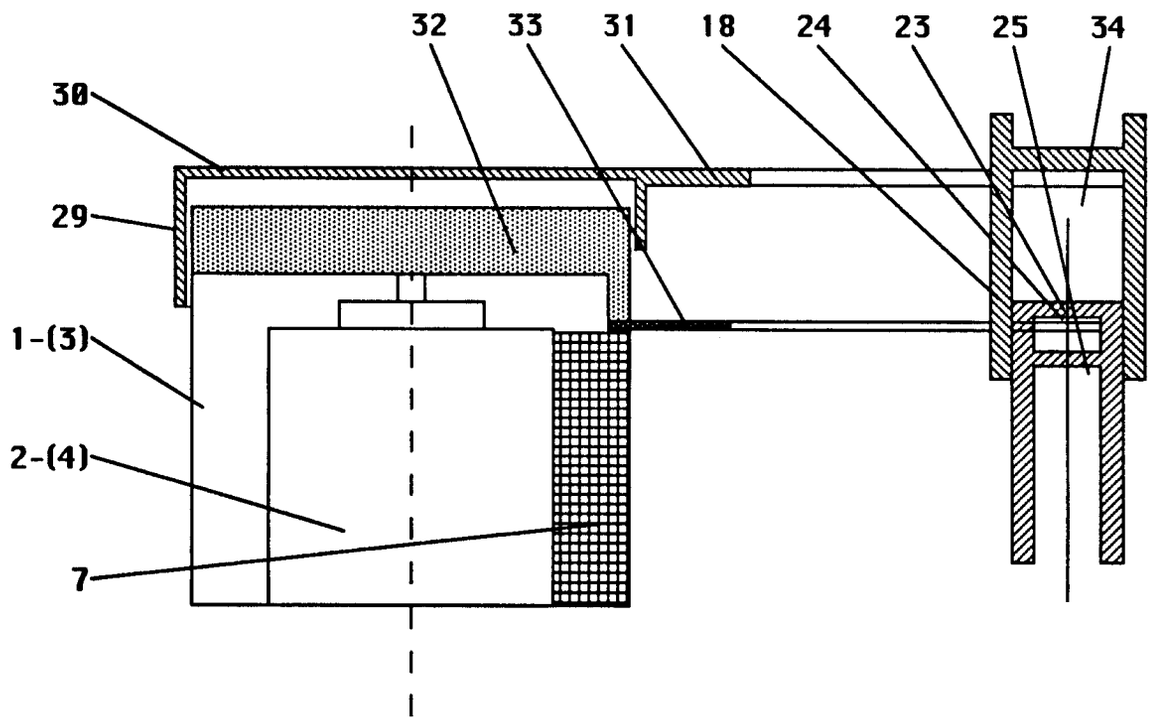


Fig.15

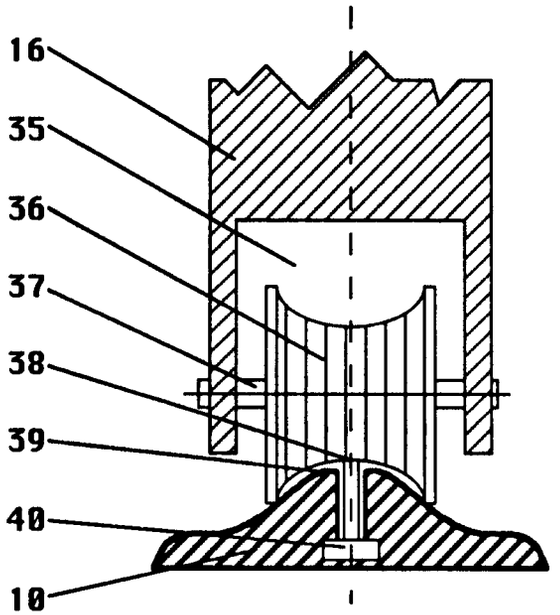


Fig.16

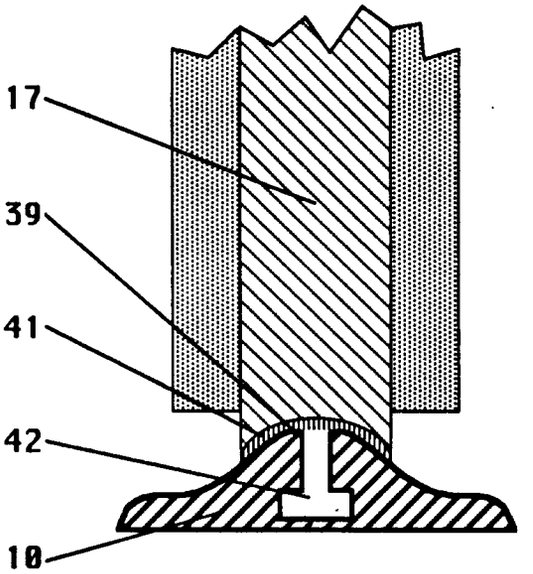


Fig.17

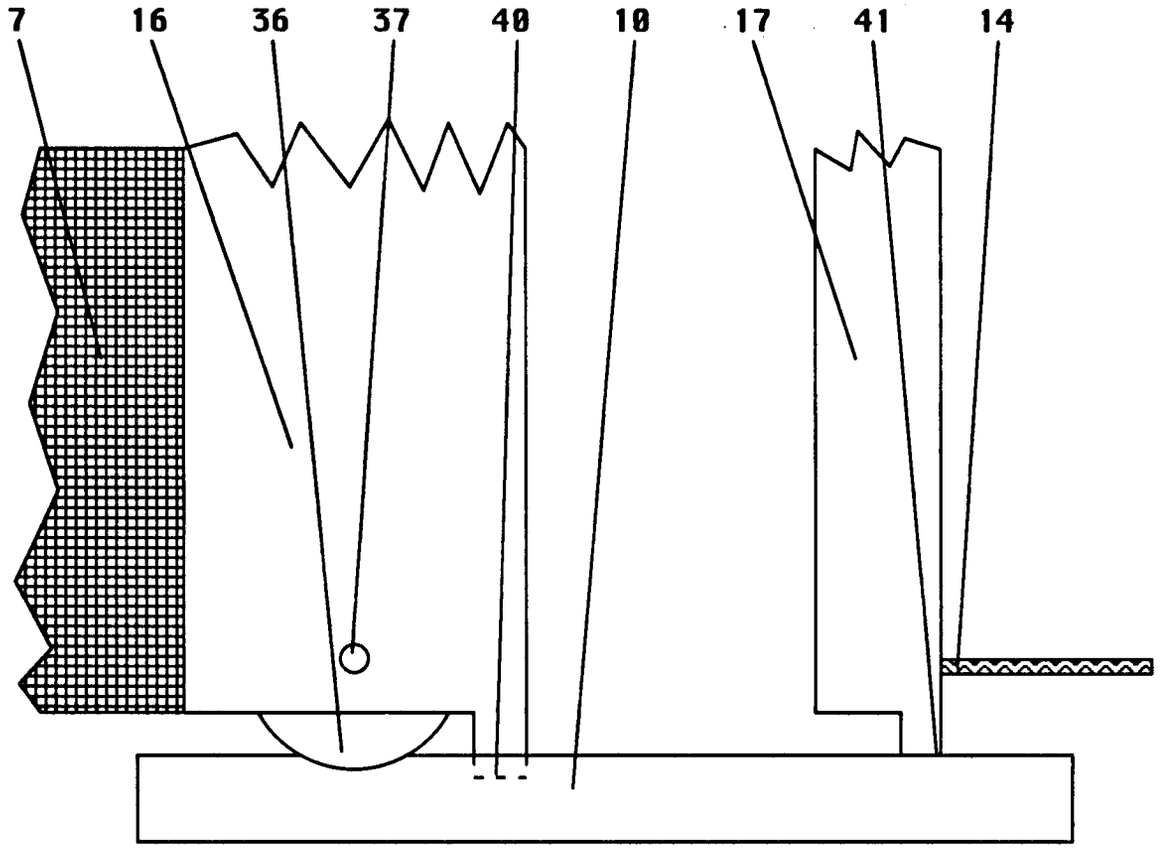


Fig.18

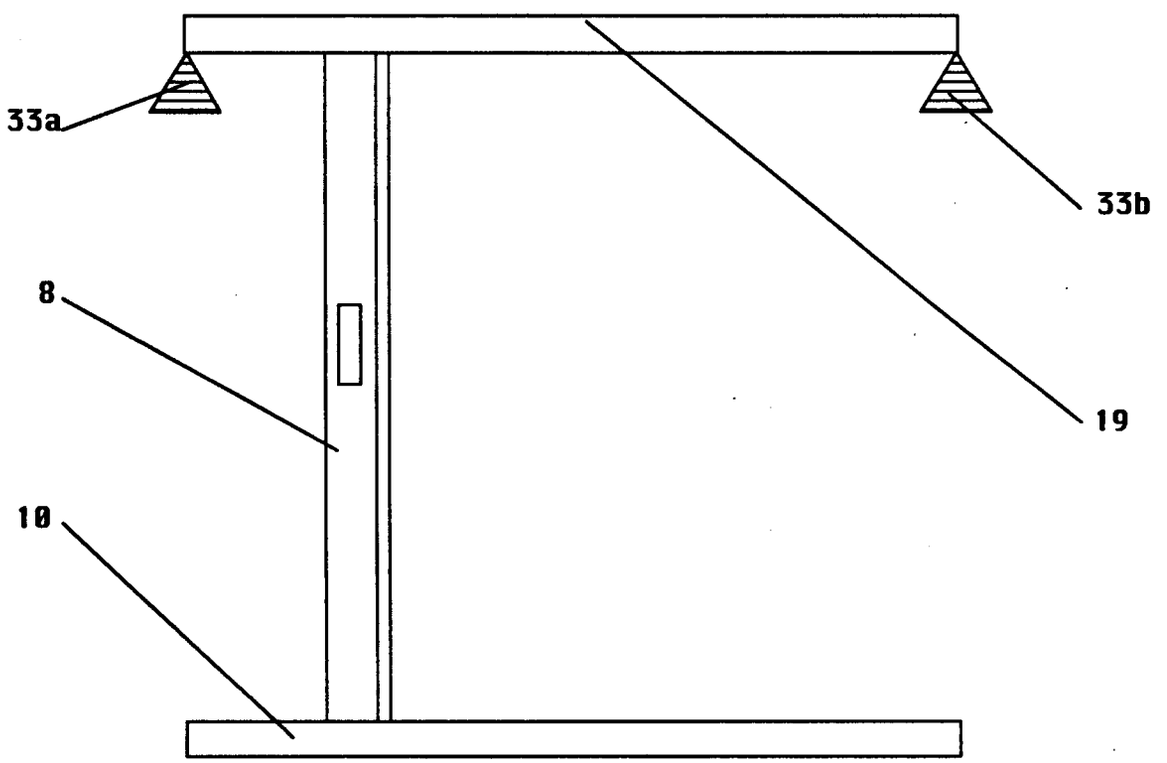


Fig.19

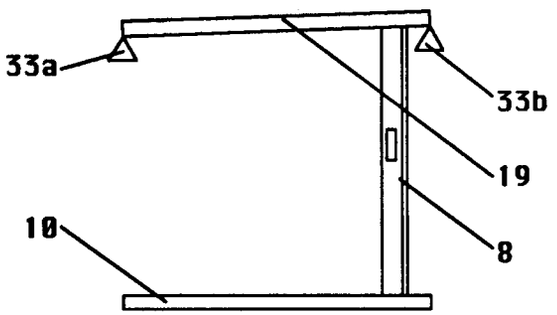


Fig.20

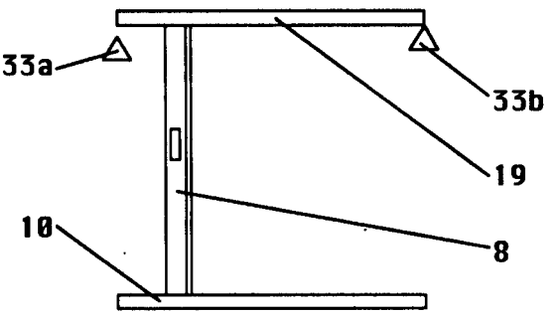


Fig.21

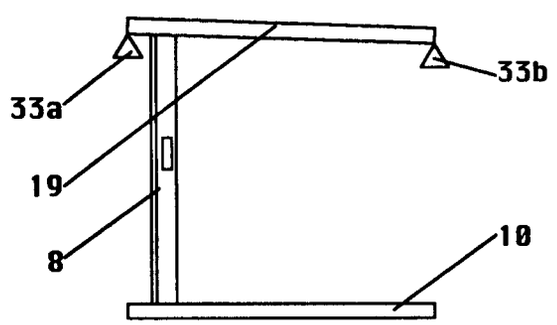
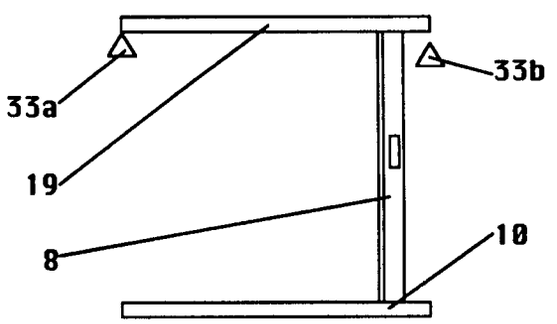


Fig.22



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EUROPEAN SEARCH REPORT

Application Number
EP 97 11 8224

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	25 March 1998	Peschel, G

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