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SECURITY DEVICE FOR ROLL-UP BLINDS ASSEMBLED FROM SLATS
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- (71) Applicant(s)
JOHANN HENKENJOHANN
- (72) Inventor(s)
JOHANN HENKENJOHANN
- (74) Attorney or Agent
DAVIES COLLISON CAVE , GPO Box 3876, SYDNEY NSW 2001
- (56) Prior Art Documents
EP 530168
DE 4335569
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- (57) Claim

1. A security device for a roll-up blind or a roll-up door which includes slats which can be rolled up and let down upon a rod, said security device including at least one slidable securing pin on a lowermost of the slats, a locking mechanism on said rod, said locking mechanism including a cam arranged on at least one side of said rod, and cooperating security finger means cooperative with said cam and projecting at one side, thereof, said security finger means being provided on an uppermost slat near the rod; the locking mechanism including catch means fixedly securable to a frame member to block the security finger means when said roll-up blind or door is closed, said cam including a recess extending to about the circumference of said rod, and an uppermost slat of the roll-up blind or door being attached to said rod, the arrangement being such that the security finger means is, guided into the recess of the cam and retaining therein when the roll-up blind is pulled up.

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ORIGINAL
COMPLETE SPECIFICATION
STANDARD PATENT

Applicant(s):

Johann Henkenjohann
Oesterwieher Strasse 80
D-33415 VERL
GERMANY

Address for Service:

DAVIES COLLISON CAVE
Patent & Trade Mark Attorneys
Level 10, 10 Barrack Street
SYDNEY NSW 2000

Invention Title:

Security device for roll-up blinds assembled from slats

The following statement is a full description of this invention, including the best method of performing it known to me:-

Security Device for Roll-up Blinds Assembled from Slats

The invention relates to a security device for a roll-up blind or roll-up door. More particularly, this invention relates to such a device which is assembled from slats and is capable of being rolled up and let down upon a rod, and where the last slat of the roll-up blind or roll-up door is provided with at least one securing pin which is outwardly slidable.

Such roll-up blinds or roll-up doors are known in the art; they use outwardly-slidable securing pins to prevent a closed roll-up blind or closed roll-up door from being slidable opened by unauthorized persons. For this purpose, as is disclosed in DE-PS 30 19 566 or DE-OS 25 21 183, an arrangement is taught where the lowest slat is provided with at least one securing pin that is slidable sideways. It works together with a spring whose initial tension forces the pin to slide out of an existing pin recess, if, when the roll-up blind or roll-up door is closed, there is no pulling force to act against the tension of the spring. The pulling force is accomplished by means of a cable that connects the uppermost securing pin to the pin provided in the lowest

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slat. In such an arrangement, use is made of the fact that during opening, the slats of a roll-up blind are maintained at a distance from one another, as opposed to the position of the slats when the roll-up blind is closed. This difference is transmitted to the securing pin via a cable that runs from the uppermost slat to the last, lowermost slat. Thus, during opening and
 5 during closing, the securing pin is retracted by means of the pull cable. In the closed position, due to the shorter distance between the slats, the pull cable is in a relaxed condition and, is outwardly slidable by the force of the spring so that it is thus permitted to slide into a lateral recesses. If, during a break-in attempt, the uppermost slat is lifted up, the slats will be separated from one another, which will thus cause the pull cable to become taut, which
 10 will cause the securing pins to retract, the result of which being that the roll-up blind, or, rather, the roll-up door, can be opened by pushing upwardly from the bottom.

One object of this invention, therefore is the further development of a modified prior art roll-up blind security system for the purpose of reducing the possibility of forced entry.

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According to one aspect of the present invention there is provided a security device for a roll-up blind or a roll-up door which includes slats which can be rolled up and let down upon a rod, said security device including at least one slidable securing pin on a lowermost of the slats, a locking mechanism on said rod, said locking mechanism including a cam
 20 arranged on at least one side of said rod, and cooperating security finger means cooperative with said cam and projecting at one side, thereof, said security finger means being provided on an uppermost slat near the rod; the locking mechanism including catch means fixedly securable to a frame member to block the security finger means when said roll-up blind or door is closed, said cam including a recess extending to about the circumference of said rod,
 25 and an uppermost slat of the roll-up blind or door being attached to said rod, the arrangement being such that the security finger means is, guided into the recess of the cam and retaining therein when the roll-up blind is pulled up.

The arrangement is preferably such that the catch, by an arresting cooperation function
 30 with the security finger, will prevent the uppermost slat of the roll-up blind from being forced

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upwards. This prevents the withdrawal of any securing pins that could be retracted by means of pull cables, a movement which can only occur if the pull cables are pulled taut by the separation of at least the lower slats of a roll-up blind when one of the upper or uppermost slats moves upwardly so as to cause the securing pins to be pulled back. The security finger, which projects far enough to be positioned over the cam, is guided by the latter in such a way that when the roll-up blind, or roll-up door is closed, the security finger is released upon the final rotation of the rod and will come to rest on top of the cam in its position beneath the catch. When the roll-up blind or roll-up door is opened, the rod attached, to the uppermost slat, is set into motion and the slat is pulled by the catch radially toward the inside (relative to the rod) so that it slides over the curve into the recess. This permits the uppermost slat to come to a rest position on the surface of the rod, and the following slats to be rolled up without



interference. The catch, against which the security finger rests, can, in this arrangement, be any one of a number of suitable elements fitted into an opening of the masonry or, alternatively, to the door or window frame. In such an arrangement, the security finger is embodied in the form of a pin fitted into the uppermost slat of a roll-up blind and which projects in a longitudinal direction beyond such a slat.

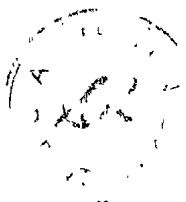
The cam can be provided with brake or stop means to stop the movement of the roll-up rod with the attached cam at a point that is optimal for the securing operation. These stop means can, for example, be a permanent magnet arranged in this optimal position and which, when an optimal point is reached, interacts with the security finger. In such an arrangement, the magnet may comprises a ferromagnetic material, which advantageously also uses a piece of magnetized, flat steel inserted into the uppermost slat.

In order to secure the uppermost slat, an further advantageous embodiment of the invention is where there is provided on the rod at least two flexible connecting elements, whose length is designed to accommodate the diameter of the rod, so that, when the roll-up blind is rolled up, the security finger will be pulled into the recess of the cam. In this arrangement, the angle of contact, which



the connectors form when the rod is wound up, is such that the length of roll-up corresponds to the angle moved through by the curve of the cam. Such a matching of the length ensures that the security finger will, during opening, slide directly into a position beneath the catch, and directly into the recess in the cam to permits the uppermost slat to come to rest on the surface of the rod. With the exception of continuous roll-blind belts, band-springs, can be used as a binding means so that the uppermost slat can be bound to the roll-up rod. In this embodiment, the use of a non-rusting steel will ensure extended life for such band springs.

It is advantageous if a stop plate is provided as the catch in the region of the rod bearing that is designed for use in conjunction with the security finger. It should preferably be arranged in such a way that its height is adjustable. In this arrangement, the height-adjustment region of the stop plate should be at least one-half the width of a slat of a roll-up blind or a roll-up door. Although the size of the porter opening for the roll-up blind or roll-up door can allow for a calculation of the number of slats required, consideration of the fact that the port was not normally designed to take into account the dimension and numbers of the slats, would dictate that it is preferable if the exact position of the catch can be adjusted to allow the security finger to be guided by the cam to a position beneath the



catch, when the lowest of the slats has come to a rest on top of the window sill or the door base and when any ventilation slits have been closed. This can be achieved is permitted by the adjustability of the height of the catch, so that it is sufficient, in general, if an adjustment is made through a range of one-half of the width of a slat, and so that the area of adjustability does not have to exceed the width of a slat.

If roll-up blinds are to be installed in new construction, the stop plates can be successfully used when installed on the front end wall of the roll-up blind or roll-up door frame with a capability of being adjusted, so that the surface of the lower edge of the stop plate forms the catch. In retrofit applications, the front wall of the frame is provided with a strip-shaped element oriented in the direction of the footing and, as a replacement for the adjustable stopping plate, forms the security stop. The length of the strip-shaped projection can be selected to exceed the expected projection length, which permits it to be cut to a length required for secure locking. This arrangement also facilitates adjustment in the case of a retrofit installation, since the screws, which hold the stop plate in position, can be accessed from the side, which is not always possible in the case of retrofits; in the front wall embodiment described above, the projection can very easily be cut to length from the front, for example, by means

of tin shears, which eliminates the need for access from the side.

A roll-up blind securing system secures roll-up blinds or roll-up doors, even when the latter can be locked by means of an additional locking system operating with laterally-acting securing pins. If such securing pins (or levers or flanges or similar elements that can be swung outwardly) are provided, the effectiveness of these securing means is augmented, and thus entirely precludes the possibility of forced entry. For this purpose, it is particularly advantageous if the cam be fitted with a peg-like projection, which, in order to prevent undesired rotation, preferably fits into the rod for the roll-up blind or the roll-up door. The projection may be embodied as, eg., a hollow rod. This peg-like extension or projection also permits adjustment of the cam along the axial direction of the rod, and it will, of course, be appreciated that following insertion, and if required adjustment, the fitted projection in the rod can be held in position by for example means of a screw.

Having thus generally described the invention, reference will now be made to the accompanying drawings, illustrating preferred embodiments.

Fig. 1 is a front view of a roll-up blind (partially-cut

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away), with a securing pin and a security finger;

Fig. 2 is a side view of the closed roll-up blind, (in a lateral guide profile);

Fig. 3 is an exploded view of an end of the rod, together with a bearing casing and entry;

Figs. 4a through 4d illustrate the sequence of interaction of the cam with the security finger (shown as a glassed-in section);

Figs 1 and 2 show medial, cut-away views of a closed roll-up blind 1, which, with its slats 2, joined to one another, closes off a window opening (or a door opening). The surface of the roll-up blind formed by slats 2, which are joined together, can be rolled up upon the rod 7 by suitable means (eg. a conventional manual or electric drive system which need not shown in greater detail). The edge sections of slats 2 slide into lateral guides 5, which, as a rule, are cemented or held into adjacent masonry and which include longitudinally-extending sealing strips 5.1 functioning to suppress rattles when the roll-up blind moves. Rod 7 is, for the purpose of rolling up the blind, rotated by means of a suitable drive system, for which purpose the ends of the rod are (together with bearing neck 8) housed and able to rotate

inside a bearing casing 10. The latter, as a rule, is located in adjacent masonry and sealed with a cover 11.

The uppermost slat 2.1 is connected to rod 7 through a band spring 9 which, for example, is attached to the upper slat by means of a clip 9.1. The result is that the first slat 2.1, together with the following slats 2, can be rolled up on rod 7 when the roll up blind is opened. In order to facilitate sliding, at least two of the slats 2 are provided with end stops, which are accommodated in the grooves of the lateral guide profiles 5. The roll-up action can now be achieved when the bottom slat, which is embodied as a close off strip 2.2, is lifted. In order to prevent this, a security insert 14 is inserted into the close-off strip that features a securing pin 5 which is slidable at an angle relative to the direction of movement of the roll-up blind. This security pin 15 is located inside a guide that running in the longitudinal direction of a close-off strip 2.2 and which is provided with a pressure spring 16 so that in the event the roll-up blind is closed, it will force the pin into a recess 6.1. Recess 6.1 is provided in a medial web 6 of the lateral guide profiles 5 to eliminate the possibility of the roll-up blind opening under upward pressure.

In order to be able to open roll-up blind 1 in the prescribed manner by means of rod 7, securing pin 15 is connected to a pull cable 17, which is connected to selected slats 2 so that the end stops of some of the slats are

embodied as end stops 3 possessing appropriately-shaped pull cable guides 4 through which the length of pull cable 17 is guided. When the roll-up blind is opened, the slats 2 are lifted up thus increasing the space or distance between them. This is most particularly the case whenever slats 2 feature aeration slits (not shown in greater detail).

Such an increase in the distance determines, with respect to the length of travel required to withdraw the securing pin, the length of the pull cable 17 and, therefore also the number of slats that are provided with end stops 3 possessing a pull cable guide 4. Should the roll-up blind be opened, such increase of distance causes the pull cable 17 to be pulled, the free end of which is affixed in one of slats 2, for example, by means of a protective bushing 17.1. This pull is transferred to securing pin 15, which is retracted, whereupon the roll-up blind is released. The number of slats 2 which are to be used in this arrangement is determined by the length of the cable required to withdraw the securing pin 15 as well as the increase in distance between two adjacent slats 2. In the drawing, only one half of the roll-up blind is illustrated. It is assumed in the drawing that two oppositely-lying securing pins are provided. Thus, the (illustrated) pull cable 17 acts on the (not-illustrated) securing pin of the other side, while the (not fully illustrated) pull cable 17' works in conjunction with

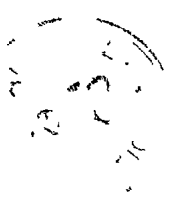
(securing pin 15). It will, of course, be appreciated that securing pins can also be arranged on one side only.

Since the securing pin can be retracted when the upper slats are lifted up, a further security arrangement can be provided for the purpose of eliminating this unwanted opening, and which can be integrated with bearing casing 10. Cover 11 of bearing casing 10 includes an opening for rod 7 and is provided with a recess 13 that opens towards the lateral guide profile 5 and to permit insertion of a security finger 22. The latter is arranged on and stands out at an angle from the uppermost slat 2.1, when the roll-up blind is (substantially) completely rolled down. Security finger 22, designed so as to be able to slide up in the direction of closure over the continuously-rising curve 21.1 of a cam 21 arranged on rod 7, is forced by such cam to move beneath a stopping plate 23 functioning as a catch. Thus, raising of the upper slats 2 with the aim of pulling back the securing pin or pins is effectively eliminated.

Fig. 3 shows the end of rod 7 with a bearing neck 8' provided on the outer wall of bearing casing 10, and to which a rod section 7.1, which snugly accommodates the end of rod 7, is attached permitting it to rotate. Attached to the entrance 10.1 of the bearing casing is a lateral guide profile 5, using an insert 10.2 which ensures a smooth transfer of the



slats of roll-up blind 1. The slats 2 of roll-up blind 1 are attached to rod 7 via band spring 9; this arrangement permits the slats to be rolled up when rod 7 is rotated. Cam 21, when the blind is in a closed position, prevents the securing pin 22, fits into uppermost slat 2.1, from deflecting or bending towards the axis of the rod. It is snugly or tightly fitted by means of a bushing 7.2 onto rod 7. Cam 21 is thus permitted to sit on rod 7 at an angle determined by the polygonal shape of rod 7, arrangement that facilitates adjustment. Cam 21, shown in this example, features a sickle-like finger 21.1 which is located in the area of the large diameter of the cam, serves as an extension of the curve which rises continuously in the direction of closure. In this arrangement, a space is provided underneath the sickle-like finger, in which space, for example, the securing pin 22 can fit in the event of tight winding. In order to block the travel path of securing pin 22, the stop plate in this embodiment is formed as a long projecting shank 26 of an insert 25. Insert 25 can be inserted into bearing casing 11 or can be attached to the casing cover cut to length at a construction site in accordance with local requirements. This arrangement permits it, in conjunction with securing pin 22, to ensure the desired, and for this arrangement of the roll-up blind, necessary locking position. The insert 25 also permits, similar to the adjustable plate 23 (Fig. 1, 2), a post-installation adjustment, if this should ever prove



necessary in the future.

Figures 4a to 4d show, by means of glassed-in sections, the sequential steps of a roll-up procedure taking a series of four selected positions. Fig. 4a illustrates the build in a rolled down and closed position. The slats 2 have run along lateral guide profiles 5 and the uppermost slat 2.1 is shown above the entry area. In this arrangement, the security finger 22 is shown in a position directly below stop plate 23 which, aided by the height adjustability feature of securing means 24, can be adjusted so that security finger 22 can rest directly against the lower edge of stop plate 23 without being pressed against it. Cover 11, which fits on top of bearing casing 10, features an opening for the passage of rod 7, onto which slats 2 of roll-up blind 1 are rolled. Cover 11 also includes recess 13 that connects opening 12 to the outside (not shown in detail) and that forms a passage for security finger 22. The latter is thus enabled, when the blind is being rolled down, to move towards the outside to catch 23, and during roll-up, to return towards the inside to rod 7. Should an attempt be made to open the roll-up blind in this position by applying an upward force, the security finger will be pressed against the lower edge of stop plate 23, and thus roll-up blind 1 will be locked against any further opening movement. This arrangement will completely prevent security finger 22 from slipping out of its position,



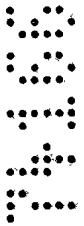
since cam 21, by blocking the passage of security finger 22 through recess 13 and into cover 11 of bearing casing 10, prevents any such motion from occurring.

Figs 4b to 4d show, in stepwise fashion, the procedure for opening the roll-up blind, roll-up gate or roll-up door. Fig. 4b shows a position in which the roll-up rod has been rotated so that the cam 21 no longer blocks passage 13; additionally, the band spring 9 is fully taut and has pulled the security finger 22 away from the stop plate, and thus through the now-unblocked recess 13 into the cover 11 of the bearing casing. If the roll-up blind is rolled up further, security finger 22 moves into recess 21.2 of cam 21, located on rod 7, and is followed, (as is shown in Figs 4c and 4d), by the uppermost slat 2.1, as well as by further slats 2. Due to the narrow width of slats 2, they are capable of being pulled between covers 11 of both of the opposite bearing casings 10. This arrangement thus permits the roll-up blind now to be pulled up, without any interference, far enough so that the securing pin or pins can be unlocked. After unlocking, the roll-up blind 1 can be rolled up in the normal fashion, in which case the "rolled-in" security finger 22 remains in the region of opening 12 of cover 11 of bearing casing 10.

The closure of roll-up blind 1 occurs in the reverse sequence. First, the slats 2 (the first of which is the closure strip 2.2), are rolled up and caused to run inside

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guide profiles 5. Following their (substantially) complete release, the uppermost slat 2.1 is freed and slides, together with its security finger 22, into the entry region of the guide profiles 5. Once again, cam 21, together with rod 7, when rotated further, closes off recess 13 inside cover 11, and permits security finger 22 to travel beneath stopping plate 23 and be held in that position.



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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A security device for a roll-up blind or a roll-up door which includes slats which can be rolled up and let down upon a rod, said security device including at least one slidable
5 securing pin on a lowermost of the slats, a locking mechanism on said rod, said locking mechanism including a cam arranged on at least one side of said rod, and cooperating security finger means cooperative with said cam and projecting at one side, thereof, said security finger means being provided on an uppermost slat near the rod; the locking mechanism including catch means fixedly securable to a frame member to block the security finger means
10 when said roll-up blind or door is closed, said cam including a recess extending to about the circumference of said rod, and an uppermost slat of the roll-up blind or door being attached to said rod, the arrangement being such that the security finger means is, guided into the recess of the cam and retaining therein when the roll-up blind is pulled up.
- 15 2. The security device in accordance with claim 1, wherein the cam of the locking mechanism is provided with a bushing insertable into, or arranged over the rod, to provide a positive or frictional connection between the bushing and the rod.

3. The security device in accordance with claim 1, wherein the locking mechanism is provided on one side of the rod that facing away from the side on which a drive is adapted to be located.

4. The security device in accordance with any one of Claims 1, 2 or 3, wherein the security finger means is in the form of a pin inserted into the uppermost slat of the roll-up blind or door and projecting outwardly in a longitudinal direction of a slat.

5. The security device in accordance with Claim 1, wherein at least two binding means are provided, for securing an uppermost slat of the roll-up blind or door to the rod, the length of said binding means having a length accommodating the diameter of the rod so that when the roll-up blind or door is rolled up, said security finger means to be pulled into a cam recess whereby the angle of contact is such that the pull-up length corresponds to the angle through which the curve of the cam moves.

6. The security device in accordance with claim 5, wherein said binding means are flexible belts.

7. The security device in accordance with claim 6, wherein said flexible belts are continuous roll-up blind belts.



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8. The security device in accordance with claim 5, wherein said binding means are band springs.

9. The security device in accordance with claim 8, wherein said band springs are
5 comprised of non-rusting steel.

10. Security device in accordance with claim 1, wherein a stop member is provided as a catch in the region of a bearing casing of said rod, said stop member being designed for use in conjunction with said security finger means.

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11. The security device in accordance with claim 10, wherein said stop member is arranged on a cover of a bearing casing whereby its height is adjustable, said cover being provided with apertures which are elongated in the direction of movement of said roll-up blind or door, said stop member includes a plurality of screws, said screws being cooperative

15 with the apertures of said cover.

12. The security device in accordance with claim 10 or claim 11 wherein said stop member is in the form of a stopping plate, the stopping plate including a strip-shaped extension of an insert insertable into a bearing casing or connectable to a bearing casing cover

20 whereby said strip-shaped extension can be cut to length.

13. The security device in accordance with claim 10 or 11, wherein the area of height adjustment of the stop member is



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at least half of the width of a slat of the roll-up blind or roll-up door.

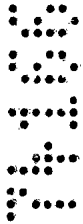
14. A security device substantially as hereinbefore described with reference to the drawings.

DATED this 22nd day of September 1994,

JOHANN HENKENJOHANN

By His Patent Attorney

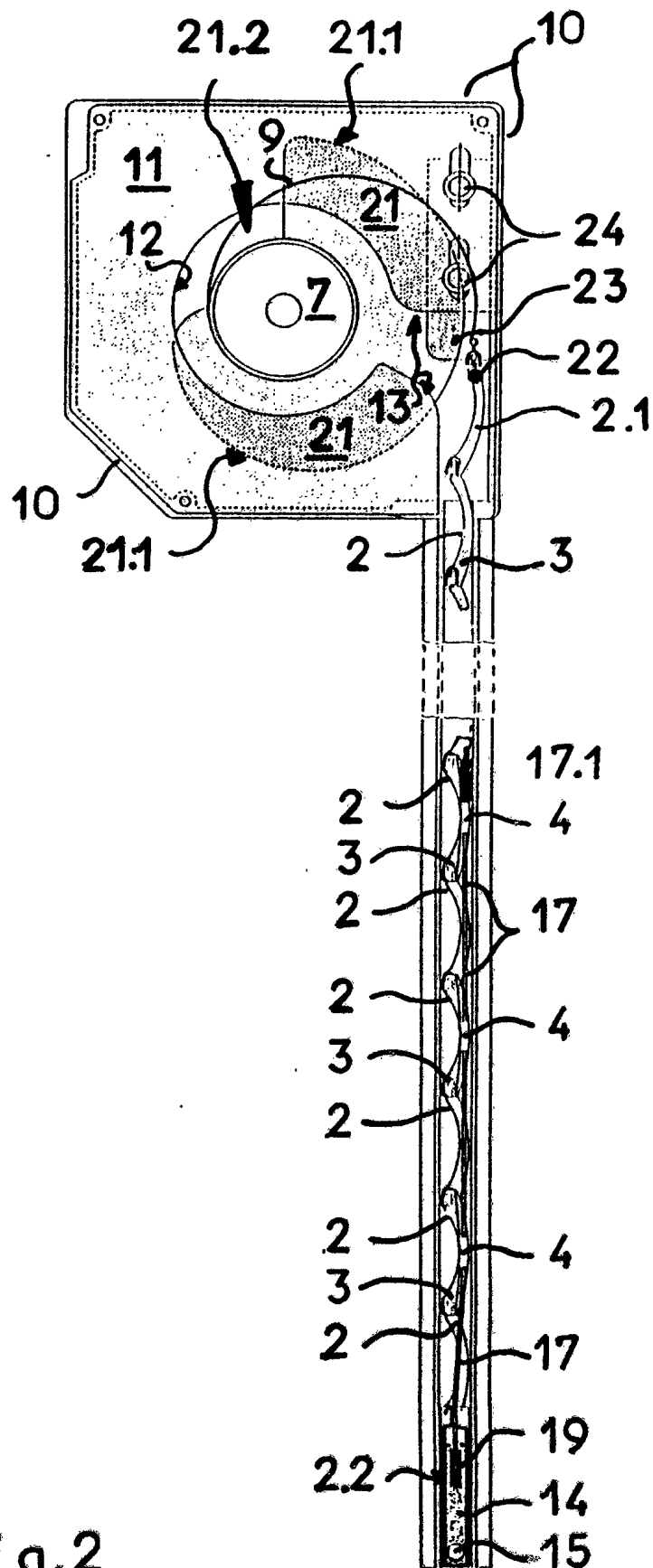
DAVIES COLLISON CAVE



ABSTRACT

The present invention discloses a security device for a roll-up blind or a roll-up door comprised of slats which can be rolled up and let down on a rod; the last slat of the blind or door is provided with at least one securing pin that can be slid out to the side. The rod includes a locking mechanism comprising a cam arranged on at least one side of the rod and a security finger interacting with the cam and standing out to the side. The security finger is provided on an uppermost slat near the rod. The locking mechanism also includes a catch that is fixedly secured to the frame and blocks the security finger when the roll-up blind is closed, whereby the cam includes a recess that extends to the circumference of the rod and whereby the uppermost slat of the roll-up blind is attached to the rod in such a way that the security finger is, when the roll-up blind is pulled up, guided into the recess of the cam and held there.

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Fig.2

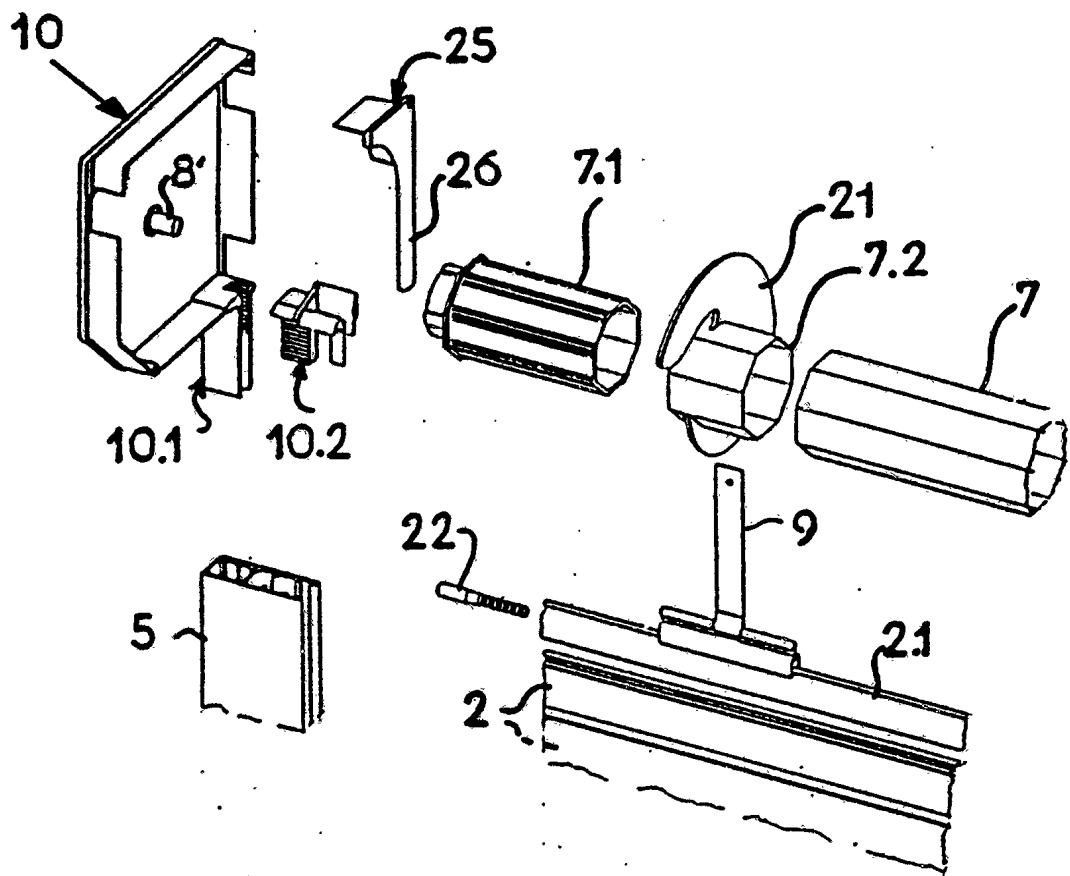


Fig. 3

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