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(54) **A WINDOW, IN PARTICULAR FOR INSTALLATION IN A FACADE, HAVING AN OPERATING
DEVICE AND A WINDOW OPERATOR**

FENSTER, INSBESONDERE ZUM EINBAU IN EINE FASSADE, MIT EINER
BEDIENUNGSVORRICHTUNG UND EINER FENSTERBEDIENUNG

FENETRE DESTINEE NOTAMMENT A UNE INSTALLATION DANS UNE FACADE, PRESENTANT
UN DISPOSITIF DE COMMANDE ET COMMANDE DE FENETRE

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(72) Inventors:
• **MARKERSEN, Ole**
DK-2820 Gentofte (DK)
• **BRADÉ, Claus, Boerge**
DK-2900 Hellerup (DK)

(30) Priority: **26.11.1996 DK 134796**

(74) Representative: **Carlsson, Eva et al**
Internationalt Patent-Bureau,
23 Hoje Taastrup Boulevard
2630 Taastrup (DK)

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(73) Proprietor: **VKR Holding A/S**
2860 Soeborg (DK)

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DE-A- 4 321 099 **FR-A- 2 622 245**
US-A- 5 271 182

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Description

[0001] The present invention relates to a window, in particular for installation in a facade, having a window frame and a window sash, the window sash being openable relative to the frame and being securable to the frame in its closed position through locking means on the sash engaging with corresponding lock fittings on the frame, whereby, following release of the locking means from the lock fittings through action of an operating device mounted on at least one frame member, the sash may then be moved away from the closed position into an open position through action of at least one window operator mounted on a frame member.

[0002] DE-A-4 321 099 discloses a ventilating device for moving a window sash from a closed position into an open position. Locking and unlocking of the sash, i.e. engagement and release, respectively, of the locking means relative to the lock fittings is carried out by the operating device.

[0003] The sash of windows of this type is in the open position secured to the frame on one hand by the operating member of the window operator and on the other hand by the hinge connection of the window, or, in case of windows opening in parallel, the guide mechanisms of the sash. When the window is open, the sash may be exposed to considerable forces. In particular in case of heavy gusts of wind there is a risk of damage to the window parts and the sash may even come loose and fall down.

[0004] With a view to this, the object of the invention is to provide a window of the type mentioned by way of introduction, in which window the risk of damage to the window parts and of the sash coming loose from the frame in an open position of the window has been substantially reduced.

[0005] This object is met by a window, which is characterized in that the operating device comprises a motor connected to a driving member drivingly engageable with a locking rod located in the sash member so as to be longitudinally displaceable relative thereto by said driving member, said locking rod having at least one engagement portion slidably engageable with a track in a corresponding lock fitting mounted on the frame, which track has a section inclined relative to the longitudinal direction of the frame member so that, when the engagement portion is slidably engaged with the inclined section of the track and the locking rod is longitudinally displaced relative thereto, the sash moves away from the frame between the closed position and a ventilating position, in which ventilating position the sash remains secured to the frame through engagement of the engagement portion of the locking rod with the track of the corresponding lock fitting, said inclined section communicating with an open section of said track extending transversely of the frame member so as to be reached by the engagement portion upon further longitudinal displacement of the locking rod, whereupon the engage-

ment portion may disengage from the lock fitting as the window operator is actuated to move the sash from the ventilating position into an open position.

[0006] By carrying out the first part of the opening movement by means of the locking rod and the lock fittings of the frame for the attainment of a ventilating position with a safe securing of the sash, the risk of damage and the sash coming loose has been substantially eliminated.

[0007] The engagement between the locking rod and the operating device and lock fittings of the frame may preferably be established by providing the locking rod with a first and a second pin which during at least a part of the opening and closing movements are guided in the tracks of these members.

[0008] In a preferred embodiment the window operator is connected with the sash member by means of a plate member which is displaceable in the transverse direction of the sash member and having a closed track corresponding to the inclined section of the track in the lock fitting of the frame member, and the locking rod is provided with a third pin for engagement with said track. In this embodiment the window operator may remain inactive during the first part of the opening movement, the operating member not having to move outwards together with the sash.

[0009] The invention will now be explained in detail in the following by means of an example of an embodiment and with reference to the schematic drawings which only show the parts of a window which are necessary for the understanding of the invention. In the drawings

Fig. 1 shows a window according to the invention in a closed starting position,

Fig. 2 the window in a ventilating position,

Fig. 3 the window in an intermediate position, in which it is released from the lock fitting, and

Fig. 4 the window in an open position controlled by the window operator.

[0010] The drawings show for instance the top member 1 of a frame and the top member 2 of a relative to the frame openable window sash of a window adapted to be mounted in a facade. In the described embodiment the window sash is connected with the frame by guide mechanisms known per se, which during the opening and closing movement of the sash keep the sash in parallel with the frame, but the sash may also be connected with the frame in a traditional manner by means of hinge connections at the bottom, the top or one of the side members.

[0011] The design of the members necessary for opening and closing will be described with reference to Fig. 1, which shows the window in the closed starting position, in which the sash is in full contact with the frame and secured thereto.

[0012] An operating device mounted on the frame member 1 comprises a motor 3 connected with a driving

member 4 with a U-shaped recess 5 for receiving a first pin 6 on a locking rod 7 displaceable in the sash member 2. In the opposite end of the frame member 1 is mounted a lock fittings 8 with a track 9 having a first, relative to the longitudinal direction of the frame member inclined section 10 and a second section 11 extending perpendicularly to the longitudinal direction of the frame member and ending in an opening 12. A second pin 13 on the locking rod 7 is, in the position shown, received in the track 9.

[0013] Between the motor 3 of the operating device and the lock fitting 8 a window operator with an operating member is mounted on the frame, the window operator being in the embodiment shown a chain operator with a motor 14 and a chain 15, the free end of which by means of a fitting 16 is hingedly connected with a plate member 17, which is displaceably connected with the sash member 2. The plate member 17 has a closed track 18, which is uniform with the first section 10 of the track 9 of the lock fitting 8, in which track a third pin 19 on the locking rod 7 is guided. The sash is secured to the frame by the pins 6, 13 and 19 being kept in abutment against the recess 5 and the tracks 9 and 18, respectively, the locking rod 7 being kept stationarily relative to the sash member 2.

[0014] By opening the window from the position shown in Fig. 1 to the ventilating position shown in Fig. 2 the motor 3 of the operating device is activated, which motor by means of transmission means (not described in detail) brings the driving member 4 and consequently the locking rod 7 to the right of the drawing. During the movement of the locking rod, the sash member 2 is pushed in a direction away from the frame member 1, i. e. outwards, the second pin 13 moving towards the right and outwards in the track 9 in the lock fitting 8. Simultaneously, the third pin 19 likewise moves towards the right and outwards in the track 18 in the plate member 17, while the chain operator, which has not been activated, via the chain 15 keeps it in full contact with the frame member 1, following which the plate member 17 is displaced in the transverse direction of the sash member 2.

[0015] A sensor, which for instance detects the position of the driving member 4, disconnects via a control system the current to the motor 3, when the position shown in Fig. 2 has been reached. The window sash is in this position secured by the second pin 13 in the track 9 and the third pin 19 in the track 18 and in the longitudinal direction of the sash solely by the first pin 6 in the recess 5 of the driving member 4, and is capable of resisting comparatively heavy loads, for instance in form of heavy wind gusts.

[0016] The size of the ventilation opening is depending on the displacement of the driving member 4 and of the inclination of the tracks 9 and 18, but normally, the sash member 2 will have moved approx. 10 mm from its starting position.

[0017] If it is desired to open the window further, the

motor 3 is activated, whereby the locking rod 7 is moved further towards the right until the second pin 13 and the third pin 19 have reached their end positions in the tracks 9 and 18 as shown in Fig. 3. The third pin 19 is positioned in an end portion of the track 18 with walls extending substantially in parallel with the longitudinal direction of the frame and sash members and the functioning of which will be explained in the following. In this position, the current to the motor 3 is disconnected, for instance by a sensor once more detecting the position of the driving member 4.

[0018] The window can now be moved to an open position by activating the motor 14 of the chain operator, which pushes the chain 15 and consequently the sash member 2 outwards. During this movement the third pin 19 abuts the interior wall part of the end portion of the track 18, while the first pin 6 disengages the recess 5 of the driving member and the second pin 13 is passed through the opening 12. After attainment of the open position shown in Fig. 4, the width of which is only limited by the length of the chain and of the movement of the sash guiding mechanisms, the current to the motor 14 is switched off.

[0019] In the completely open position the sash is only secured to the frame by the sash guide mechanisms and the chain 15 and is thus comparatively sensitive to wind load. To prevent the window from being damaged during such loads, and at the worst the window sash from coming loose and falling down, sensors of per se known type are provided which via the control system activate the motor 14 of the chain operator to pull the sash into full contact with the frame for the attainment of the position shown in Fig. 3, following which the motor 3 is activated and pulls, during the movement of the locking rod 7 towards the left, the sash further in contact with the frame for the attainment of the first ventilating position in Fig. 2 or the completely closed position in Fig. 1.

[0020] With a view to securing a parallel guiding of the sash, an operating device and a chain operator may be provided at each frame member or at least at two opposite members, in which case the motors then have to run synchronously to avoid overload of the sash guiding mechanisms and the chain operators. Furthermore, the control of the operating device and the chain operator for each sash/frame member pair should be coordinated such that the motor of the operating device cannot be activated, when the chain operator is active, and vice versa.

Claims

1. A window, in particular for installation in a facade, having a window frame and a window sash, the window sash being openable relative to the frame and being securable to the frame in its closed position through locking means on the sash engaging with

corresponding lock fittings on the frame, whereby, following release of the locking means from the lock fittings through action of an operating device mounted on at least one frame member (1), the sash may then be moved away from the closed position into an open position through action of at least one window operator (14, 15) mounted on a frame member, **characterized in that** the operating device comprises a motor (3) connected to a driving member (4) drivably engageable with a locking rod (7) located in the sash member so as to be longitudinally displaceable relative thereto by said driving member (4), said locking rod having at least one engagement portion (13) slidably engageable with a track (9) in a corresponding lock fitting mounted on the frame, which track (9) has a section (10) inclined relative to the longitudinal direction of the frame member so that, when the engagement portion (13) is slidably engaged with the inclined section (10) of the track (9) and the locking rod is longitudinally displaced relative thereto, the sash moves away from the frame between the closed position and a ventilating position, in which ventilating position the sash remains secured to the frame through engagement of the engagement portion (13) of the locking rod with the track of the corresponding lock fitting, said inclined section (10) communicating with an open section (11) of said track (9) extending transversely of the frame member so as to be reached by the engagement portion (13) upon further longitudinal displacement of the locking rod, whereupon the engagement portion (13) may disengage from the lock fitting as the window operator is actuated to move the sash from the ventilating position into an open position.

2. A window according to claim 1, **characterized in that** the locking rod (7) is provided with a first pin (6) for engagement with a recess (5) in the driving member (4).
3. A window according to claim 1 or 2, **characterized in that** the locking rod (7) has a second pin (13) for engaging said track (9) in the lock fitting (8) of the frame.
4. A window according to claim 1, 2 or 3, **characterized in that** the window operator (14, 15) is connected with the sash member (2) by means of a plate member (17) which is displaceable in the transverse direction of the sash member and having a closed track (18) corresponding to the inclined section (10) of the track (9) in the lock fitting of the frame member, and **in that** the locking rod is provided with a third pin (19) for engagement with said track.

Patentansprüche

1. Fenster, insbesondere zum Einbau in eine Fassade, mit einem Blendrahmen und einem Flügelrahmen, welcher Flügelrahmen im Verhältnis zum Blendrahmen aufschliessbar ist und in seiner geschlossenen Stellung über auf dem Flügelrahmen vorgesehene Verriegelungsorgane, die in entsprechende Schliessbeschläge auf dem Blendrahmen eingreifen, an dem Blendrahmen verriegelt werden kann, wobei nach Entriegeln der Verriegelungsorgane aus den Schliessbeschlägen durch Betätigung einer zumindest auf einem Blendrahmenteil (1) montierten Bedienungsvorrichtung der Flügelrahmen anschliessend durch Betätigung zumindest einer auf einem Blendrahmenteil montierten Fensterbedienung (14, 15) von der geschlossenen Stellung in eine offene Stellung bewegt werden kann, **dadurch gekennzeichnet, dass** die Bedienungsvorrichtung einen Motor (3) umfasst, der mit einem Mitnehmer (4) in Verbindung steht, welcher Mitnehmer in eine im Flügelrahmenelement angeordnete Schubstange (7) antreibbar eingreift, so dass die Schubstange durch den Mitnehmer (4) gegenüber dem Flügelrahmen in Längsrichtung versetzbar ist, wobei die Schubstange zumindest einen in eine Spur (9) eines auf dem Blendrahmen montierten entsprechenden Schliessbeschlages gleitend eingreifenden Eingriffsteil (13) aufweist, welche Spur (9) einen gegenüber der Längsrichtung des Blendrahmenelements schräggestellten Abschnitt (10) hat, so dass, wenn der Eingriffsteil (13) mit dem schräggestellten Abschnitt (10) der Spur (9) in gleitendem Eingriff steht und die Schubstange im Verhältnis dazu in Längsrichtung versetzt ist, sich der Flügelrahmen zwischen der geschlossenen Stellung und einer Ventilationsstellung vom Blendrahmen weg bewegt, wobei der Flügelrahmen in der Ventilationsstellung durch Eingreifen des Eingriffsteils (13) der Schubstange in die Spur des entsprechenden Schliessbeschlages an dem Blendrahmen befestigt bleibt, wobei der schräggestellte Abschnitt (10) mit einem offenen Abschnitt (11) erwähnter quer zum Blendrahmenteil verlaufenden Spur (9) zusammenarbeitet, so dass der offene Abschnitt bei weiterem Versetzen der Schubstange in Längsrichtung durch den Eingriffsteil (13) erreicht wird, wonach der Eingriffsteil (13) bei Aktivieren der Fensterbedienung zur Bewegung des Flügelrahmens von der Ventilationsstellung in eine offene Stellung aus dem Schliessbeschlag gelöst werden kann.
2. Fenster nach Anspruch 1, **dadurch gekennzeichnet, dass** die Schubstange (7) einen ersten Zapfen (6) zum Eingriff in eine im Mitnehmerelement (4) vorgesehene Aussparung (5) aufweist.
3. Fenster nach Anspruch 1 oder 2, **dadurch gekennzeichnet,**

zeichnet, dass die Schubstange (7) einen zweiten Zapfen (13) zum Eingriff in die im Schliessbeschlag (8) des Blendrahmens vorgesehene Spur (9) aufweist.

4. Fenster nach Anspruch 1, 2 oder 3, **dadurch gekennzeichnet, dass** die Fensterbedienung (14, 15) mittels eines Plattenelements (17) mit dem Flügelrahmenteil (2) verbunden ist, welches Plattenelement in der Querrichtung des Flügelrahmens versetzbar ist und eine dem schräggestellten Abschnitt (10) der Spur (9) im Schliessbeschlag des Blendrahmens entsprechende geschlossene Spur (18) aufweist, und dass die Schubstange mit einem dritten Zapfen (19) zum Eingriff in erwähnte Spur versehen ist.

Revendications

1. Fenêtre destinée notamment à une installation dans une façade, présentant un cadre de fenêtre et un ouvrant de fenêtre, ouvrant qui peut être ouvert par rapport au cadre et fixé au cadre dans sa position fermée par des moyens de serrure sur l'ouvrant en engagement avec des garnitures de serrure sur le cadre, l'ouvrant, après dégagement des moyens de serrure depuis les garnitures de serrure par l'actionnement d'un dispositif de commande monté sur au moins une partie de cadre (1), étant susceptible d'être déplacé de la position fermée à une position ouverte par l'actionnement d'au moins une commande de fenêtre (14, 15) montée sur une partie de cadre, **caractérisée en ce que** le dispositif de commande comprend un moteur (3) relié à un élément d'entraînement (4) qui peut être engagé de manière entraînante avec une tige de serrure (7) positionnée dans la partie d'ouvrant si bien que ladite tige peut se déplacer longitudinalement par rapport à la partie de cadre au moyen dudit élément d'entraînement (4), tige de serrure qui présente au moins une portion d'engagement (13) susceptible de s'engager de manière glissante avec une voie (9) dans une garniture de serrure correspondante montée sur le cadre, voie (9) qui présente une portion (10) inclinée par rapport à la direction longitudinale de la partie de cadre si bien que, lorsque la portion d'engagement (13) est engagée de manière glissante avec la portion inclinée (10) de la voie (9) et la tige de serrure a été déplacée longitudinalement par rapport à la voie, l'ouvrant s'éloigne du cadre en se déplaçant entre une position fermée et une position de ventilation, position de ventilation dans laquelle l'ouvrant reste fixé au cadre par engagement de la portion d'engagement (13) de la tige de serrure avec la voie de la garniture de serrure correspondante, cette portion inclinée (10) étant en communication avec une portion ouverte (11) de ladite

voie (9) s'étendant transversalement de la partie de cadre pour être rejointe par la portion d'engagement (13) après déplacement longitudinal supplémentaire de la tige de serrure, après quoi la portion d'engagement (13) peut être désengagée de la garniture de serrure étant donné que la commande de fenêtre est actionnée à déplacer l'ouvrant de la position de ventilation à une position ouverte.

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2. Fenêtre selon la revendication 1, **caractérisée en ce que** la tige de serrure (7) est pourvue d'un premier tenon (6) pour engagement avec un évidement (5) dans l'élément d'entraînement (4).

3. Fenêtre selon la revendication 1 ou 2, **caractérisée en ce que** la tige de serrure (7) est pourvue d'un deuxième tenon (13) pour engagement avec ladite voie (9) dans la garniture de serrure (8) du cadre.

4. Fenêtre selon la revendication 1, 2 ou 3, **caractérisée en ce que** la commande de fenêtre (14, 15) est reliée à la partie d'ouvrant (2) au moyen d'un élément de plaque (17) qui peut se déplacer dans la direction transversale de la partie d'ouvrant et présente une voie fermée (18) correspondant à la portion inclinée (10) de la voie (9) dans la garniture de serrure de la partie de cadre, et **en ce que** la tige de serrure est pourvue d'un troisième tenon (19) pour engagement avec ladite voie.

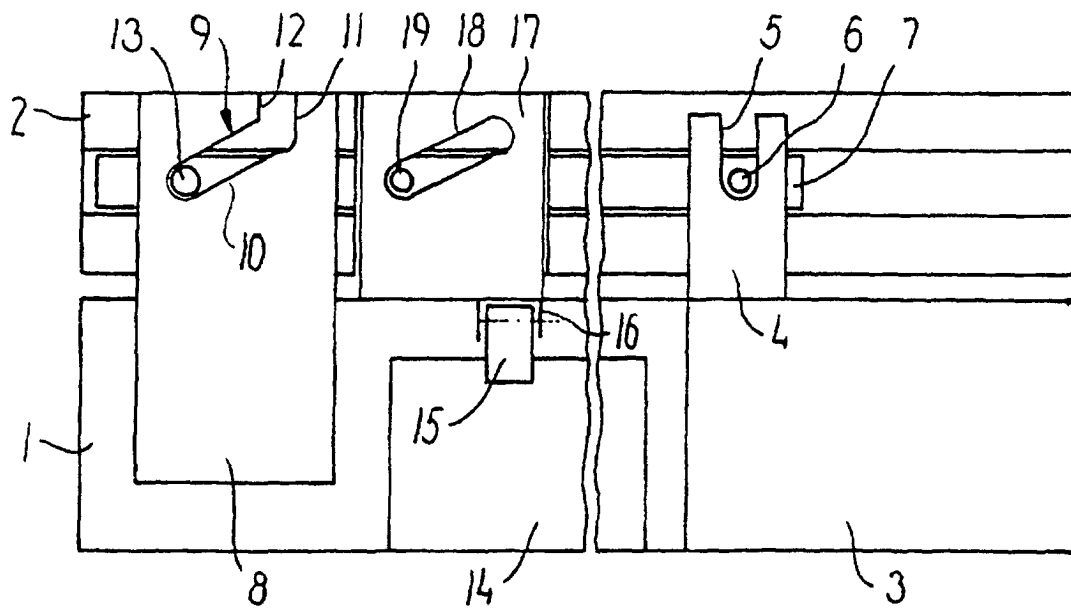


FIG. 1

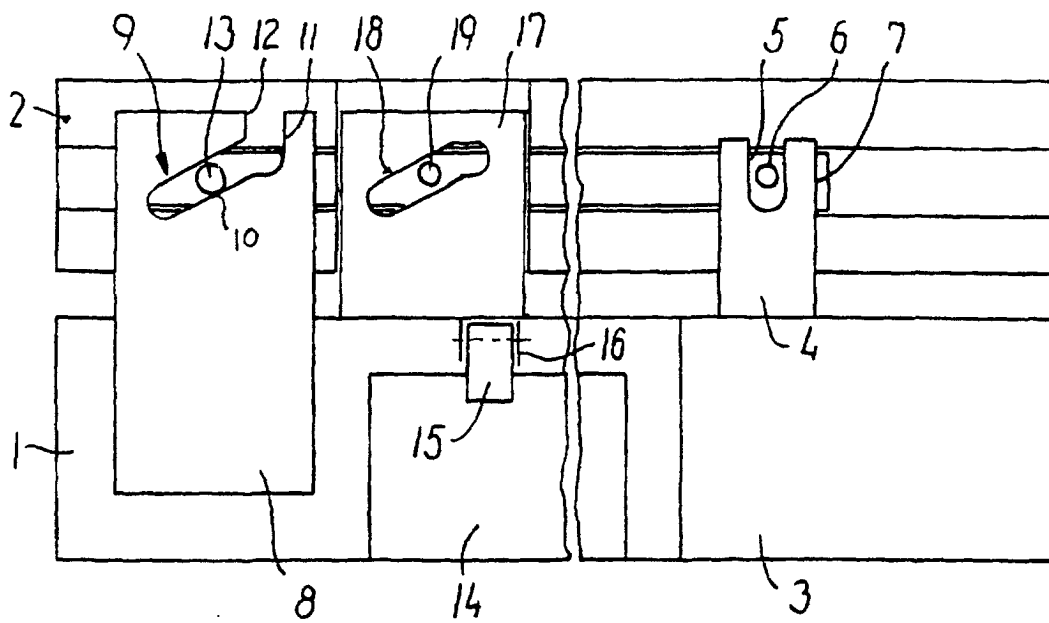


FIG. 2

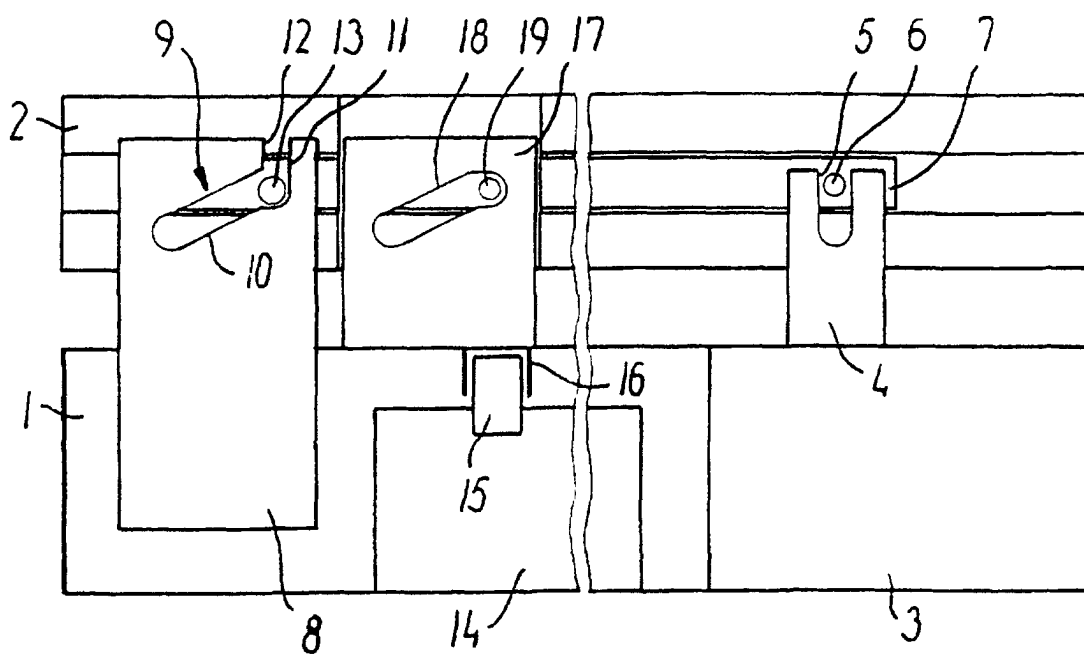


FIG. 3

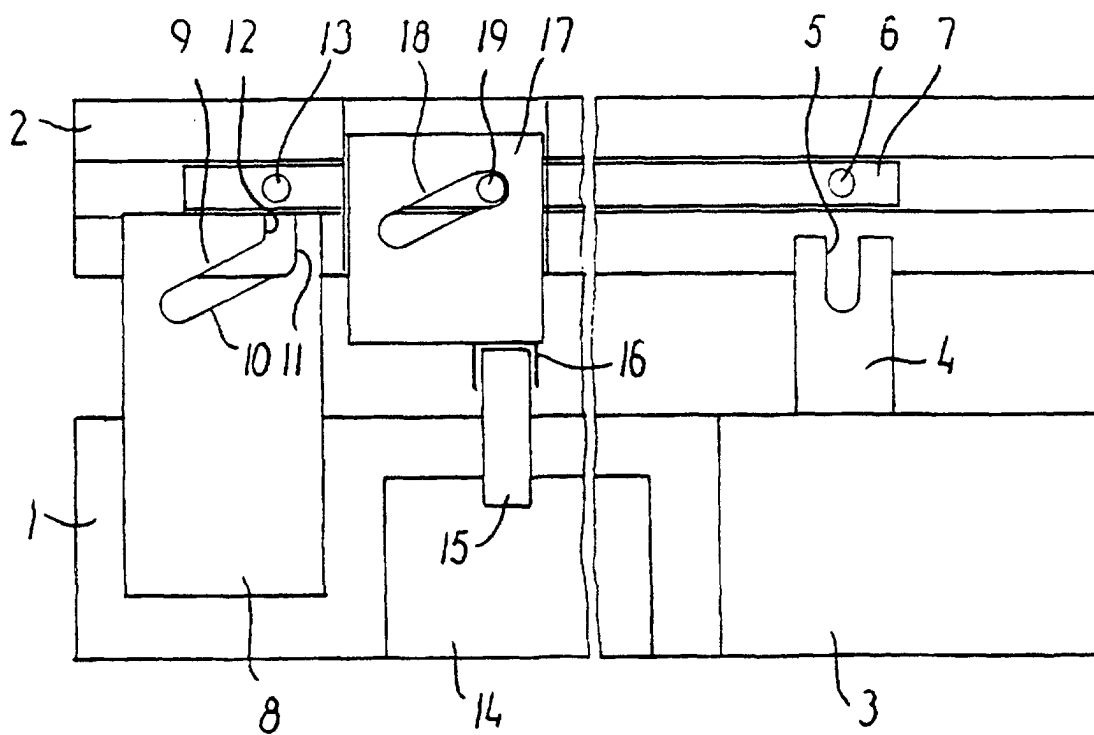


FIG. 4