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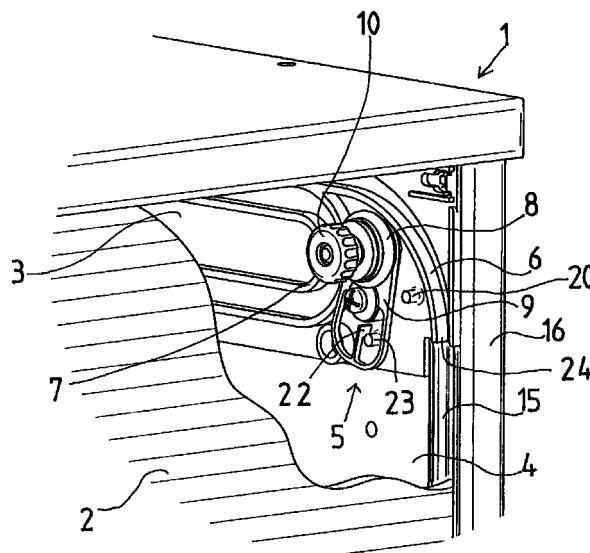
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(54) **Brake device**

(57) A brake device (5) for a roll-top door (2) whose side edges are guided each in their channel (3) has a brake member (8) at each channel (3). The brake members (8) are eccentrically disposed each on their lever (9), and when the roll-top door (2) moves downwards, the brake device (5) is self-applying. On application, the brake member (8) urges the side edge of the roll-top door (2) against the channel (3), the frictional force between them increasing and functioning as a retarding force.

Fig 1



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Description**TECHNICAL FIELD**

[0001] The present invention relates to a brake device for a roll-top door whose side edges are each guided in their channel.

BACKGROUND ART

[0002] Roll-top or roll-front doors have long been employed, for example, in furniture primarily for office use. Other fields of application are cabinets for gas bottles at petrol stations and, in more robust constructions, even as garage doors. The materials employed for such roll-top or roll-front doors in these fields of use, vary: wood being principally employed for office furniture, while metal, for example aluminium, is employed in more robust constructions.

[0003] When the roll-top door is opened, i.e. is slid upwards, the upwardly displaced section is taken care of in different ways. In office furniture, this section may be led up along the inside of the top piece of the furniture in order thereafter to be led down along the inside of the rear piece of the furniture. Another method is that the upwardly slid section of the roll-top door is led into channels on the inside of the side pieces of the furniture. In such instance, the channels are suitably substantially spiral shaped in shape.

[0004] In most cases, it is desirable that the movement of the roll-top door be more or less controlled, among other things to reduce the risk of pinch or crush injuries. In office furniture, this problem has on many occasions been solved with the aid of counterweights which prevent the roll-top door from moving downwards at excessively high speed. However, one disadvantage inherent in counterweights is that they counteract the movement of the door to an excessive degree during those parts of the movement when a slightly higher speed is actually desirable.

[0005] Another method of controlling the movement of the roll-top door is to provide it with a brake device. However, prior art devices have suffered from the drawback that the entire movement is retarded excessively, and not only the final distance of the movement where the speed and risk of pinch or crush injury are at their greatest.

PROBLEM STRUCTURE

[0006] Hence, the intention is to limit the speed of the roll-top door principally in the lower distance of its closing movement, at the same time as it must be easy to slide the roll-top door upwards.

SOLUTION

[0007] The object forming the basis of the present

invention will be attained if the brake device intimated by way of introduction is characterised in that a brake member is eccentrically disposed on a lever at each channel, so that the brake is self-applying when the roll-top door moves downwards.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0008] The present invention will now be described in greater detail hereinbelow, with particular reference to the accompanying Drawings. In the accompanying Drawings.

Fig. 1 is a perspective view of an upper corner of an office cabinet with a partly cut-away roll-top door, behind which the device according to the present invention is shown;

Fig. 2 is a perspective view of a brake device according to the present invention;

Fig. 3 is a straight side elevation of a channel included in the present invention in which the device according to the invention is mounted, in a first, inactive state; and

Fig. 4 is a view corresponding to that of Fig. 3 in a second, activated state.

DESCRIPTION OF PREFERRED EMBODIMENT

[0009] Fig. 1 shows the brake device 5 in a cabinet 1 principally for office use, and provided with a roll-top door 2. On the inside of each of the side pieces 4 of the cabinet 1, there is disposed a guide in the form of a channel 3 or roll-top curve with grooves in which the edge portion of the roll-top door 2 is intended to run. Along the front side edges 16 of the cabinet 1, rails 15 are provided as a downward continuation of the grooves of the channel 3. A brake device 5 is disposed close to the front side edge 16 of the cabinet 1 and in a curved transitional zone between the vertical rail and the upper and outer groove of the channel 3, the brake device consisting of a brake member 8 which is mounted on a lever 9. The brake device 5 is pivotal between two extreme positions, of which the one, a braking or activated position, entails that the brake member 8 extends in over the channel in the transitional zone of its groove, while the second position entails that a roll-top door 2 may freely pass through the transitional zone. In order to prevent the brake device 5 from assuming positions beyond the two intended extreme points, the channel is provided with two arrest pins 19, 20 on either side of the lever 9 when this is located in a position between the extreme points. The arrest pins 19 and 20 are shown most clearly in Fig. 3.

[0010] As best shown in Figs. 3 and 4, each of the

channels 3 is substantially in the form of an oval spiral in a plane. The channel 3 is designed as a groove in a substantially rectangular plate. The rails 15 are connected to each respective channel 3 in the outermost turn of the spiral at reference numeral 24. The innermost turn of the spiral has an end 17 and when the upper end of the roll-top door 2 has reached this point, the roll-top door 2 is fully retracted.

[0011] Fig. 2 shows the brake device 5 in close-up. The major components of the device are the brake member 8 and the lever 9. The brake member 8 is rotatably disposed on the lever 9. Preferably, the brake member 8 consists of a reel or a wheel with a central hole. A stub shaft 12 which is fixed in the lever extends through the central hole and its outer end is threaded, while its inner end portion has a smooth circumferential surface and is of circular cross section so that it may serve as a bearing for the brake member or wheel 8. Between the two end portions, there is a transitional portion whose cross sectional area in the preferred embodiment is approximately oval. The length of the inner portion of the stub shaft 12 substantially corresponds to the axial thickness of the brake member 8.

[0012] Outside the brake member 8, there is disposed a smooth, approximately circular washer 18. The washer 18 has a substantially oval hole through which extends the transitional portion of the stub shaft 12 of oval cross section. Consequently, the washer is not rotary in relation to the stub shaft, but is, to some extent, axially movable along it.

[0013] On the outer, threaded portion of the stub shaft 12, an operating device 10 in the form of a thumbwheel is provided. The operating device 10 has a central, interiorly threaded hole whose threads are disposed to mesh with the threads on the stub shaft 12. A spring washer 11 is disposed between the operating device 10 and the washer 18, the spring washer 11 being preferably manufactured of metal. On tightening of the operating device 10, an axial force is applied to the washer 18 via the spring washer 11, and because of the friction between the rotary brake member 8 and the lever 9, and the washer 18, respectively, the ability of the brake member 8 to rotate freely is reduced.

[0014] In principle, the brake device 5 is symmetric throughout its entire longitudinal axis. A screw 13 and a bushing 14 are disposed in the lever 9 on the longitudinal axis in such a manner that the mass centre of the entire brake device 5 lies on the same side of the screw 13 as the brake member 8, this within the permitted pivotal positions of the lever 9 as defined by the two arrest pins 19 and 20. The screw 13 and the bushing 14 are disposed to pivotally secure the brake device 5 in the channel 3. Since the mass centre lies on the one side of the screw 13, an eccentric suspension will be obtained in the channel 3. This eccentricity is most clearly apparent in Figs. 3 and 4.

[0015] In order to amplify the action of the eccentricity on the position of the lever, i.e. its striving to pivot

the lever with the brake member 8 into engagement with the inside of the roll-top door, the lever 9 has, in its lower region, a resilient tongue 22 which co-operates with a pin 23 disposed on the channel 3 (Fig. 3).

[0016] When the cabinet 1 is in use, it is often desirable to move the roll-top door 2 up or down. It is desirable if the upward movement takes place as rapidly as possible and that the downward movement is retarded in order to avoid the risk of pinch or crush injuries. Thus, it is reasonable that the brake is applied only on the downward movement of the roll-top door, and preferably only in the final distance of this movement. On an upward movement of the roll-top door and during the initial stage of the downward movement, the brake is not to be applied.

[0017] Fig. 3 shows the de-activated position of the brake device 5. The brake member 8 is, in such instance, pivoted in a counterclockwise direction so far that the tongue 22 abuts against the pin 23 and does not extend, or extends but insignificantly, in over the channel 3, for which reason the roll-top door 2 may freely pass the brake member 8. This position of the brake device 5 is typical in the upwardly directed movement of the roll-top door 2. If the brake device 5, because of its eccentric suspension, or the action of the resilient tongue 22, were to be pivoted clockwise, the upwardly moving roll-top door 2 which passes the brake member 8 in an upwardly directed movement and to the left in the Figure, will move the brake member 8 in the same direction on first contact. The brake device 5 is, in such instance, forced to rotate a short distance counterclockwise until such time as the contact between the roll-top door 2 and the brake member 8 eases or ceases. The brake device 5 is thus returned to its de-activated state.

[0018] That portion 21 of the lever 9 which is opposed to the brake member 8 extends an insignificant distance in over the spiral portion of the channel 3. When the uppermost, and first retracted portion of the roll-top door 2 reaches this position, it will be able to pass but will then come into contact with the lower portion 21 of the lever 9 whereby the lever will, against the action of the resilient tongue 22, be pivoted somewhat in a counterclockwise direction so that the roll-top door 2 will continue to assist in retaining the brake device 5 in its de-activated state where the brake member 8 is wholly located outside the grooves of the channel and thus is not in engagement with the roll-top door.

[0019] When the roll-top door 2 is once again drawn out from fully retracted position, the roll-top door 2 will, by contact with the lower portion 21 of the lever, prevent the brake device 5 from being activated and applied, as long as the first retracted portion of the roll-top door has not yet passed the lower portion of the lever 9. Until such time, the roll-top door 2 will, as was disclosed above, block the movement of the lever 9 in over the channel 3.

[0020] As soon as the roll-top door 2 has wholly passed the lower portion 21 of the lever 9, the brake

device 5 is free to move in over the channel 3 and does so under the action of the resilient tongue 22 and the eccentric suspension of the lever. When the brake member 8 now comes into contact with the outwardly moving roll-top door 2, which now moves to the right and downwards in Fig. 4, the brake device is caused to rotate a distance clockwise and the application of the brake device becomes even harder. The brake device 5 is thus self-applying.

[0021] The actual retardation of the roll-top door 2 takes place in two ways. Primarily, the brake member 8 urges the roll-top door against the edge of the channel 3. The retardation then takes place with the aid of the friction between the roll-top door 2 and the edge of the channel 3.

[0022] The other type of retardation is related to the retarding rotation of the brake member 8 around the stub shaft 12. One precondition is that the brake member 8 does not slip to any appreciable degree in relation to the inside of the roll-top door 2. On contact between the brake member 8 and the inside of the roll-top door 2, the downward speed of the roll-top door 2 is then limited by the rotation of the brake member 8 in relation to the lever 9. The lightness with which the brake member 8 rotates is adjusted in the manner described above with the aid of the operating device 10. The harder the operating device 10 is tightened, the more sluggishly will the brake member 8 rotate and the harder will the brake device be applied against the inside of the roll-top door. At a certain position of the operating device 10, the tightening will be, however, so hard that the brake member 8 slides or slips against the inside of the roll-top door 2 and the above-described retardation effect will be cancelled. In this case, the friction braking against the edge of the channel 3 will still function.

[0023] The present invention may be modified without departing from the scope of the appended Claims.

Claims

1. A brake device (5) for a roll-top door (2) whose side edges are each guided in their channel (3), **characterised in that** a brake member (8) is eccentrically disposed on a lever (9) at each channel (3), so that the brake device (5) is self-applying when the roll-top door moves downwards.
2. The brake device (5) as claimed in Claim 1, **characterised in that** the brake member (8), on application, is disposed to urge the side edge of the roll-top door (2) against the channel (3), the frictional force between the roll-top door (2) and the channel (3) increasing and acting as a retarding force.
3. The brake device (5) as claimed in Claim 1 or 2, **characterised in that** the brake member (8) is rotatably disposed on the lever (9); and that the brake member (8) is disposed to be set in motion by the roll-top door (2).
4. The brake device (5) as claimed in Claim 3, **characterised in that** the brake member (8) is tensioned in between two discs (9, 18) in the axial direction; and that the force with which the brake member (8) is tensioned in is variable.
5. The brake device (5) as claimed in any of Claims 1 to 4, **characterised in that** the lever (9) is suspended in a point below the brake member (8) and the mass centre of the brake device (5).
6. The brake device (5) as claimed in any of Claims 1 to 5, **characterised in that** a portion of the lever (9) extends in over the channel (3) for actuation from the side edges of the roll-top door (2).

Fig1

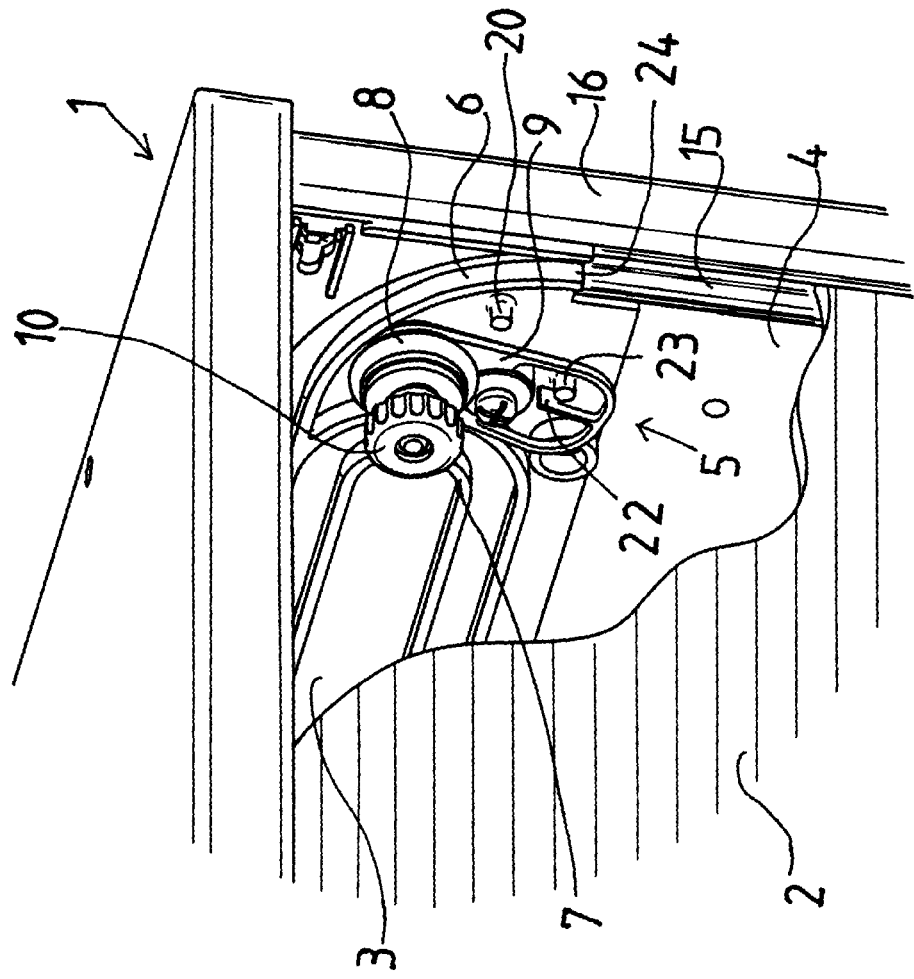


Fig 2

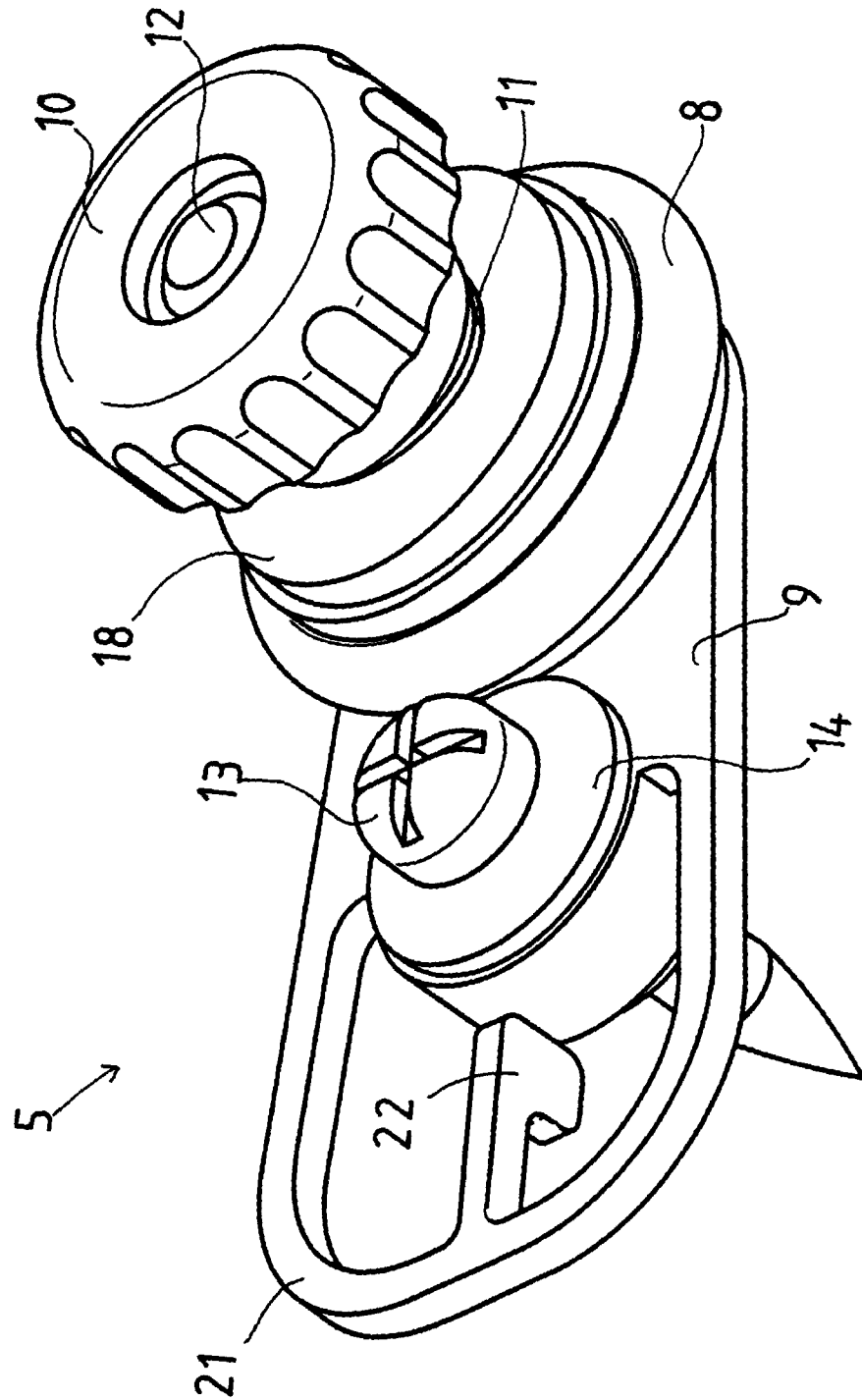


Fig 3

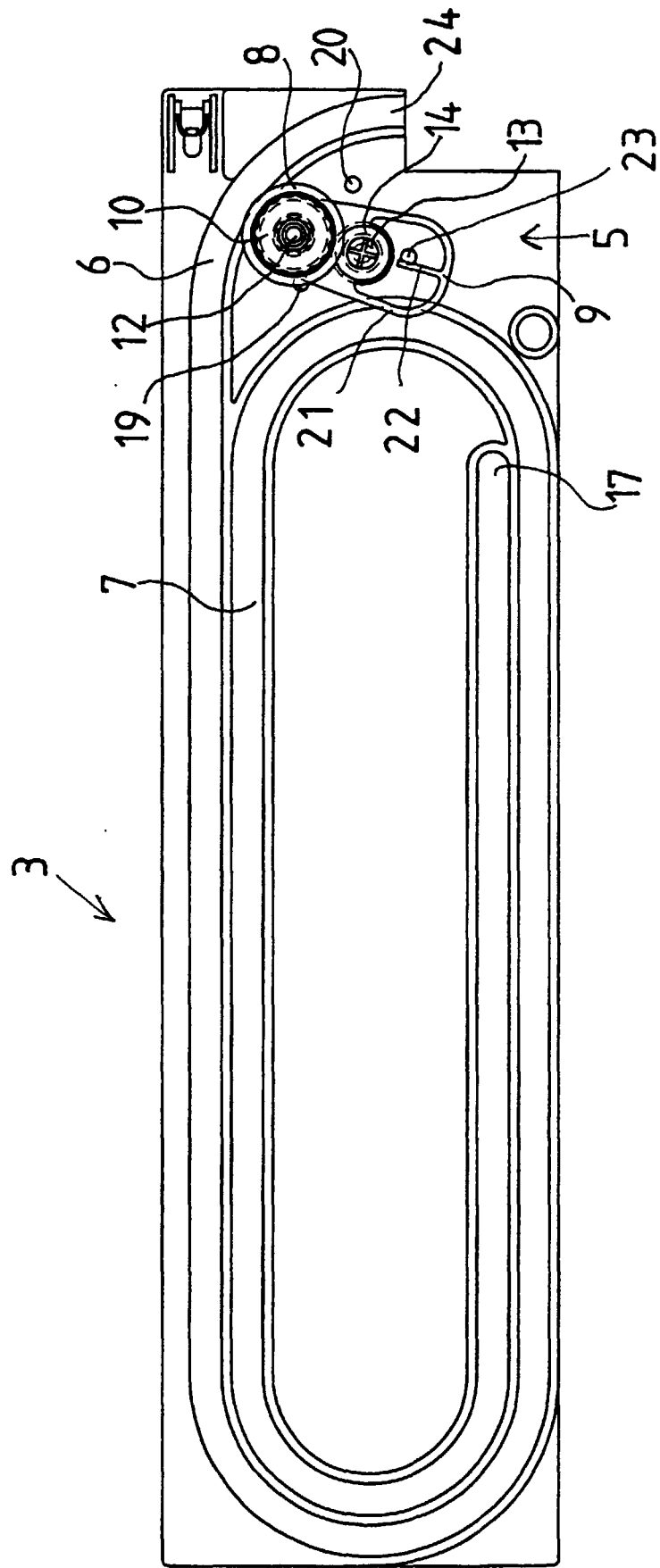
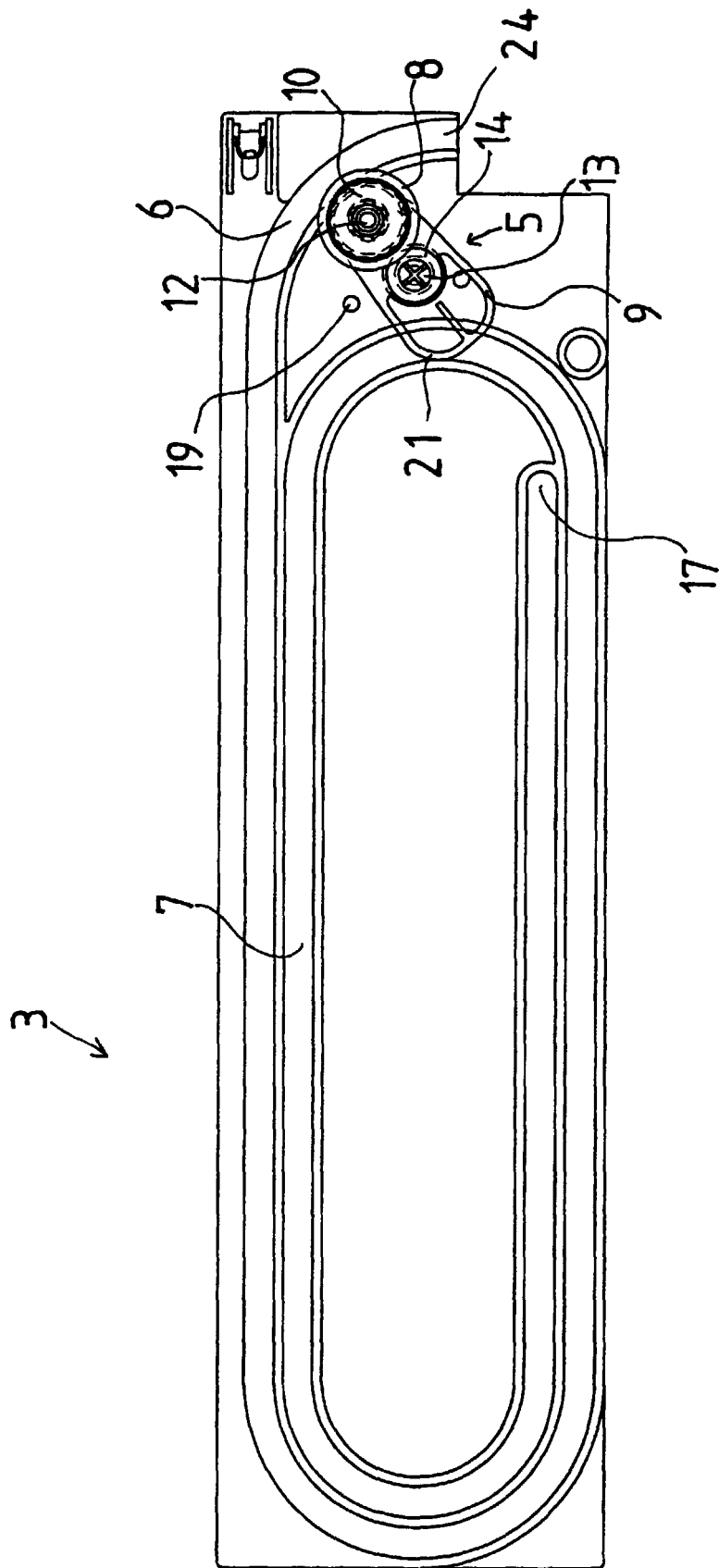


Fig 4





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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 2397

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 2 317 415 A (MARTELA AG) 25 March 1998 (1998-03-25) * abstract; figure 5 *	1-3, 5	E06B9/84 E06B9/11
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E06B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 November 2000	Examiner Peschel, G
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			

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07-11-2000

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