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(72) Inventor: Lam, Chi Ming
Kowloon Bay, Kowloon
Hong Kong Sar (CN)

(74) Representative: Jenkins, Richard Gavin et al
Marks & Clerk
43 Park Place
GB-Leeds LS1 2RY (GB)

(71) Applicant: Kader Industrial Company Limited
Kowloon, Hong Kong SAR (CN)

(54) Toy car track segment

(57) A track segment (10) for use in a track for toy cars, comprises a body (100) defining three road sections (110, 120 & 130) meeting at a junction (200), and a diverter (300) at the junction (200) for diverting a car from the first section (110) to one of the second and third sections (120 & 130). The diverter (200) is pivotable in op-

posite directions between first and second positions for the car to run to the second and third sections (120 & 130) respectively. Included is an actuator (400) at one of the sections (110, 120 & 130) for operation by the car passing by to pivot the diverter (200) from the prevailing first or second position to the other position alternately as the actuator (400) is successively operated.

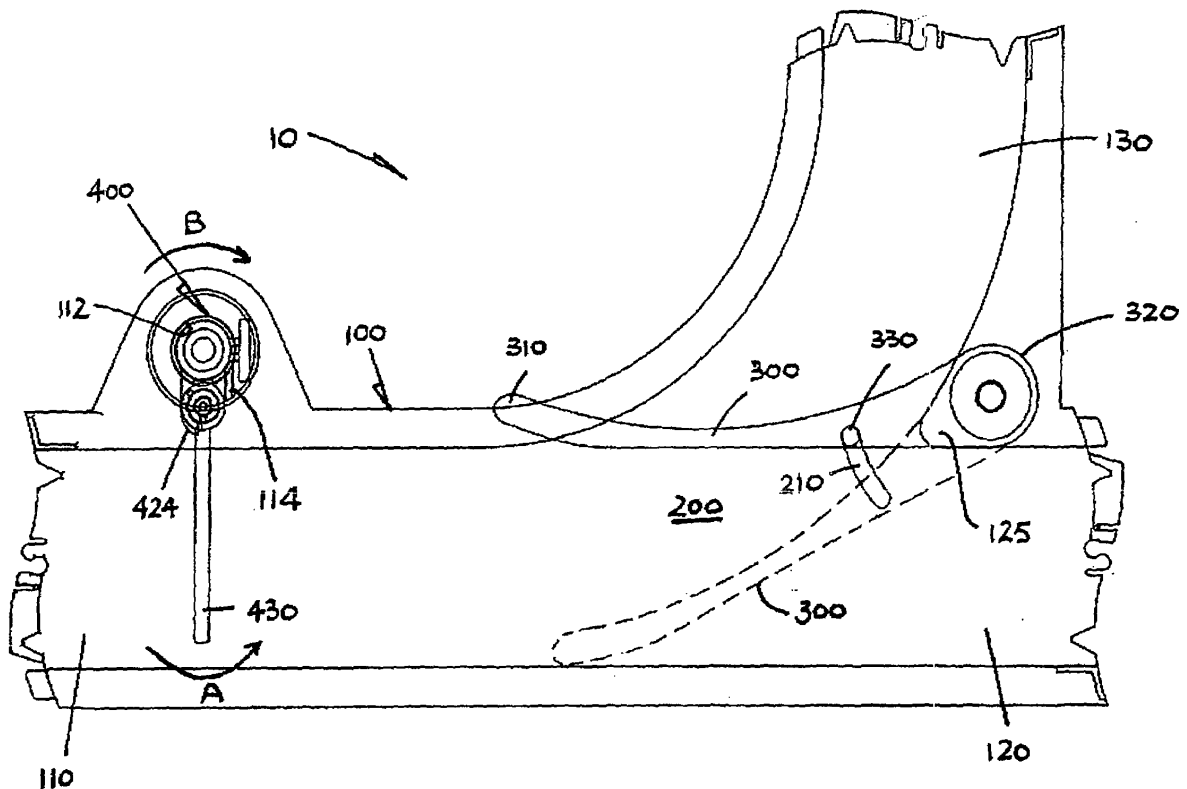


FIG. 1

Description

[0001] The present invention relates to a segment of a track for playing toy cars and particularly but not exclusively remote-controlled toy cars.

BACKGROUND OF THE INVENTION

[0002] Toy car tracks that include two routes and a road diverter between the routes have been generally known.

[0003] The subject invention seeks to provide an improved track segment for a toy car track, which includes a diverter that is operated in a novel way to add more variation and fun to the game.

SUMMARY OF THE INVENTION

[0004] According to the invention, there is provided a track segment for use in a track for toy cars, comprising a body defining first, second and third road sections meeting at a junction, and a diverter provided at the junction for diverting a car from the first section to one of the second and third sections. The diverter is pivotable in opposite directions between first and second positions for said car to run to the second and third sections respectively. Included is an actuator provided at one of the sections for operation by said car passing by to pivot the diverter from the prevailing first or second position to the other position alternately as the actuator is successively operated.

[0005] Preferably, the first and second sections extend co-linearly, and the third section turns smoothly therefrom.

[0006] More preferably, the diverter extends in its first position substantially straight relative to the first and second sections across the third section and extends in the second position at an acute angle relative thereto across the second section.

[0007] It is preferred that each road section has a shallow generally U-shaped cross-section, and the diverter is hinged at a junction kerb between the second and the third sections for pivotal movement between the first and the second positions.

[0008] It is preferred that the actuator is pivotably supported and is arranged to be turned for operation by said car passing by.

[0009] More preferably, the actuator includes a spring for self returning to a normal position for operation by said car passing by.

[0010] Further more preferably, the actuator includes a base rotatably supported on one side of the first section and a bar extending therefrom, the base being resiliently biased by the spring to point the bar normally in a direction across the first section.

[0011] Yet further more preferably, the bar is pivotably supported by the base, between which a second spring co-acts to resiliently bias the bar to point normally in said

direction across the first section.

[0012] Yet still further more preferably, the base is capable of being turned only in one direction and the bar in the opposite direction only.

5 **[0013]** In a preferred embodiment, the actuator is operable in only one direction and is arranged to allow said car to pass by in the opposite direction without being operated.

10 **[0014]** More preferably, the actuator is provided at the first section and is operable by said car only running in the direction from the second or third section to the first section.

15 **[0015]** The track segment preferably includes a linkage provided between the actuator and the diverter to enable the actuator to pivot the diverter.

[0016] More preferably, the linkage comprises discrete first and second parts for pivoting the diverter in opposite directions respectively.

20 **[0017]** Further more preferably, the two parts of the linkage are resiliently biased apart at a position about the diverter.

[0018] It is preferred that the actuator includes a cam for operating the linkage.

25 **[0019]** It is further preferred that the linkage comprises discrete first and second parts for pivoting the diverter in opposite directions respectively, and the cam comprises two parts for successively operating respective parts of the linkage.

30 **[0020]** The invention also provides a toy car track incorporating the aforesaid track segment, in combination with at least one remote-controlled toy car for running on the track.

BRIEF DESCRIPTION OF DRAWINGS

35 **[0021]** The invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

40 Figure 1 is a top plan view of an embodiment of a toy car track segment in accordance with the invention, said segment including a diverter and an actuator therefor;

45 Figure 2 is a side elevational view of the track segment of Figure 1;

50 Figures 3 and 3A are side elevational views of the actuator of Figure 1, showing the actuator in normal and operating positions respectively;

55 Figures 4 and 4A are side elevational views of the actuator of Figure 1, showing the actuator in normal and non-operating positions respectively;

Figure 5 is a bottom plan view of the track segment of Figure 1, showing the diverter and actuator and a linkage therebetween;

Figures 6 and 6A are bottom plan views corresponding to Figure 5, showing the actuator pivoting the diverter by means of the linkage in one direction; and

Figures 7 and 7A are bottom plan views similar to Figures 6 and 6A, showing the actuator pivoting the diverter by means of the linkage in the opposite direction.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0022] Referring to the drawings, there is shown a track segment 10 embodying the invention for use in a track for playing toy cars, especially remote-controlled toy cars that can run and turn in opposite directions as desired. The track is typically built by connecting a plurality of track segments end-to-end together to form an endless course for one or usually two or more toy cars to run or race with each other. The track segment 10 is employea,

often in a pair, to provide a branched circuit including more than one loop for added fun of play. **[0023]** The track segment 10 has a moulded plastic flat body 100 which defines three i.e. first, second and third road sections 110, 120 and 130 meeting at a junction 200, each having a shallow U-shaped cross-section and leading to an end/port of the segment 10 for joining with a respective adjacent segment. The first and second road sections 110 and 120 extend co-linearly to form part of a straight road for example, with the third section 130 turning smoothly through 90° therefrom to start a side turn.

[0024] A horizontal diverter bar 300, slightly curved, is provided at the junction 200 for diverting a car from the first section 110 to the third section 130. The bar 300 has front and rear ends 310 and 320 and includes a bottom peg 330 nearer to the latter. The rear end 320 is hinged at a junction kerb 125 between the second and the third sections 120 and 130, such that the bar 300 is freely pivotable in opposite directions across the road surface between a straight position (solid line in Figure 1) relative to the first and second sections 110 and 120 across the third section 130 and an acute angled position (dashed line in Figure 1) relative thereto across the second section 120.

[0025] While the diverter bar 300 is in the straight position, the second section 120 is unobstructed so that a car can run straight from the first section 110 down to the second section 120, or vice versa should the car run in the opposite direction. If the car comes from the third section 130, it will turn into the first section 110 while flipping the bar 300 to the angled position.

[0026] In the angled position, the diverter bar 300 diverts a car to turn from the first section 110 to the third section 130, or vice versa should the car run in the opposite direction. If the car enters the junction 200 from the second section 120, it will move straight onto the first section 110 while flipping the bar 300 to the straight po-

sition.

[0027] The diverter bar 300 can be pivoted by a car either upon direct hit thereby or indirectly by means of an actuator 400 provided on the first section 110 via a linkage 500 arranged under the segment body 100. The diverter peg 330 extends through an arcuate slot 210 in the road for displacement by the linkage 500, whereby the bar 300 is pivoted in opposite directions.

[0028] The actuator 400 has a generally cylindrical upright base 410 whose upper end 411 is exposed and lower end 412 is rotatably supported inside a cylindrical seat 112 on one side of the first road section 110. The base 410 is spring-loaded to turn or self-return to and rest in a normal position, whose upper end 411 has a radial support 420 on which there is cantilevered a horizontal bar 430.

[0029] The actuator bar 430 has front and rear ends 431 and 432, with the latter being hinged to the support 420 for the bar 430 to be pivotable about a vertical axis. A torsional coil spring 424 in the support 420 co-acts between the support 420 and the rear end 432 such that the bar 430 is spring-loaded to turn and extend normally at right angles across the first road section 110. By reason of a fixed abutment 424 on the left side of the support 420 obstructing the bar 430, the bar 430 can only swivel relative to the support 420 through about 90° to the right in direction A (from Figure 4 to Figure 4A).

[0030] The actuator body lower end 412 has a vertical central shaft 413, on which a helical spring 414 and a cam sleeve 415 are disposed. The sleeve 415 is keyed at 417 with the seat 112 against rotation so that it can only slide along the shaft 413 while being resiliently biased upwards into the upper body end 411 by the spring 414 below it. The sleeve 415 has on its outer surface a pair of diametrically opposite V-shaped cam profiles 416 that are urged by the spring 414 to bear slidingly against respective cam followers (protrusions e.g. ribs) on the inner surface of the upper body end 411.

[0031] For each V-shaped cam profile 416, its either side is cooperable with the associated follower through a cam action, such that as the actuator base 410 is turned from its normal position in either direction the sleeve 415 is pushed downwards. The spring 414 urges the sleeve 415 back upwards to return the base 410 (upon release) to its normal position through reversed cam action. In this embodiment, the base 410 is obstructed by a stop 114 on the right side of the seat 112 such that it can only turn one way i.e. in direction B through an angle limited by another stop to 90°.

[0032] The lowermost end of the actuator shaft 413 projects through the bottom of the seat 112, to which end there is connected a cam 440 for unidirectional rotation thereby via a circular ratchet 443. The cam 440 has a double-layered structure consisting of upper and lower cam discs 441 and 442 each having three equiangularly spaced corners K, oriented such that their six corners K taken together symmetrically alternate as between upper and lower ones i.e. spaced at 60° apart.

[0033] The ratchet 443 is fitted in a central aperture of the cam discs 441/442, which has two resilient asymmetrical teeth for engaging (in direction B) and skipping (in opposite direction A) six complementarity shaped notches 444 of the discs 441/442 around their aperture. Due to the presence of six notches 444 in the discs 441/442, the cam 440 will be rotated stepwise each time through 60° to advance one corner K.

[0034] The linkage 500 is formed by discrete upper and lower links 510 and 520 for pivoting the diverter bar 300 by its peg 330 in opposite directions respectively between the straight and the angled positions. The upper link 510 has a crooked first end 511 contacting the upper cam disc 441 and a straight second end 512 extending to one side of the diverter peg 330. The link 510 is hinged at an intermediate position 515 and is resiliently biased by a spring 514 to urge its first end 511 against the upper cam disc 441 for pivoting thereby through cam action and to rest with its second end 512 next to the relevant end of the slot 210.

[0035] The lower link 520 has two separate sections, namely a crooked first section 521 and a straight second section 522, which are pivotably connected end-to-end together at 523. The first section 521 is hinged at an intermediate position 525A and is resiliently biased by a spring 524 to bear against the lower cam disc 442 for pivoting thereby through cam action. The second section 522 is hinged at an intermediate position 525B and extends to the opposite side of the diverter peg 330. Under the action of the spring 524 via the first section 521, the second section 522 rests at a position next to the other end of the slot 210.

[0036] Insofar as the two links 510 and 520 are concerned, they are resiliently biased apart (by the springs 514 and 524) at a position about the peg 330 of the diverter 300, such that the diverter 300 remains freely pivotable by the car direct irrespective of its prevailing position.

[0037] The actuator 400 operates as follows. As the base 410 can only be turned in direction B whilst the bar 430 is fixed thereto in that direction, the overall actuator 400 will be turned in that direction by a car running past it from the second/third road section 120/130 to the first road section 110, thereby rotating the cam 440 (discs 441/442) in the same direction through 60° to turn one disc corner K past the linkage 500. Given that the corners K are presented alternately as between upper and lower ones, the two links 510 and 520 will be pivoted in turn upon successive operations of the actuator 400 by the car or cars, thereby pivoting the diverter 300 from the prevailing position, whether it be straight or angled, to the other position, and vice versa.

[0038] Although the actuator base 410 is held against turning in direction A, the bar 430 is free to pivot relative thereto in that direction to allow a car to pass by in the opposite direction i.e. from the first road section 110 to the second/third road section 120/130. Without its base 410 being turned the actuator 400 is inoperative for cars

approaching the junction 200 from the first road section 110, and the condition of the diverter 300 is unaltered. Thus, the actuator 400 is operable in only one direction and is arranged to allow a car to pass by in the opposite direction without being operated.

[0039] The invention has been given by way of example only, and various modifications of and/or alterations to the described embodiment may be made by persons skilled in the art without departing from the scope of the invention as specified in the appended claims.

Claims

1. A track segment for use in a track for toy cars, comprising:
 - a body defining first, second and third road sections meeting at a junction;
 - a diverter provided at the junction for diverting a car from the first section to one of the second and third sections, the diverter being pivotable in opposite directions between first and second positions for said car to run to the second and third sections respectively; and
 - an actuator provided at one of the sections for operation by said car passing by to pivot the diverter from the prevailing first or second position to the other position alternately as the actuator is successively operated.
2. The track segment as claimed in claim 1, **characterized in that** the first and second sections extend co-linearly, and the third section turns smoothly therefrom.
3. The track segment as claimed in claim 2, wherein the diverter extends in its first position substantially straight relative to the first and second sections across the third section and extends in the second position at an acute angle relative thereto across the second section.
4. The track segment as claimed in any one of claims 1 to 3, **characterized in that** each road section has a shallow generally U-shaped cross-section, and the diverter is hinged at a junction kerb between the second and the third sections for pivotal movement between the first and the second positions.
5. The track segment as claimed in any one of claims 1 to 4, **characterized in that** the actuator is pivotably supported and is arranged to be turned for operation by said car passing by.
6. The track segment as claimed in any preceding claim, **characterized in that** the actuator includes a spring for self returning to a normal position for

operation by said car passing by.

7. The track segment as claimed in claim 6, **characterized in that** the actuator includes a base rotatably supported on one side of the first section and a bar extending therefrom, the base being resiliently biased by the spring to point the bar normally in a direction across the first section. 5
8. The track segment as claimed in claim 7, **characterized in that** the bar is pivotably supported by the base, between which a second spring co-acts to resiliently bias the bar to point normally in said direction across the first section. 10
9. The track segment as claimed in claim 7 or claim 8, **characterized in that** the base is capable of being turned only in one direction and the bar in the opposite direction only. 15
10. The track segment as claimed in any preceding claim, **characterized in that** the actuator is operable in only one direction and is arranged to allow said car to pass by in the opposite direction without being operated. 20
11. The track segment as claimed in any preceding claim, **characterized in that** the actuator is provided at the first section and is operable by said car only running in the direction from the second or third section to the first section. 25
12. The track segment as claimed in any preceding claim, **characterized in** including a linkage provided between the actuator and the diverter to enable the actuator to pivot the diverter. 30
13. The track segment as claimed in claim 12, **characterized in that** the linkage comprises discrete first and second parts for pivoting the diverter in opposite directions respectively. 35
14. The track segment as claimed in claim 13, **characterized in that** the two parts of the linkage are resiliently biased apart at a position about the diverter. 40
15. The track segment as claimed in any one of claims 12 to 14, **characterized in that** the actuator includes a cam for operating the linkage. 45
16. The track segment as claimed in claim 15, **characterized in that** the linkage comprises discrete first and second parts for pivoting the diverter in opposite directions respectively, and the cam comprises two parts for successively operating respective parts of the linkage. 50
17. A toy car track incorporating the track segment as claimed in any preceding claim, in combination with at least one remote-controlled toy car for running on the track. 55

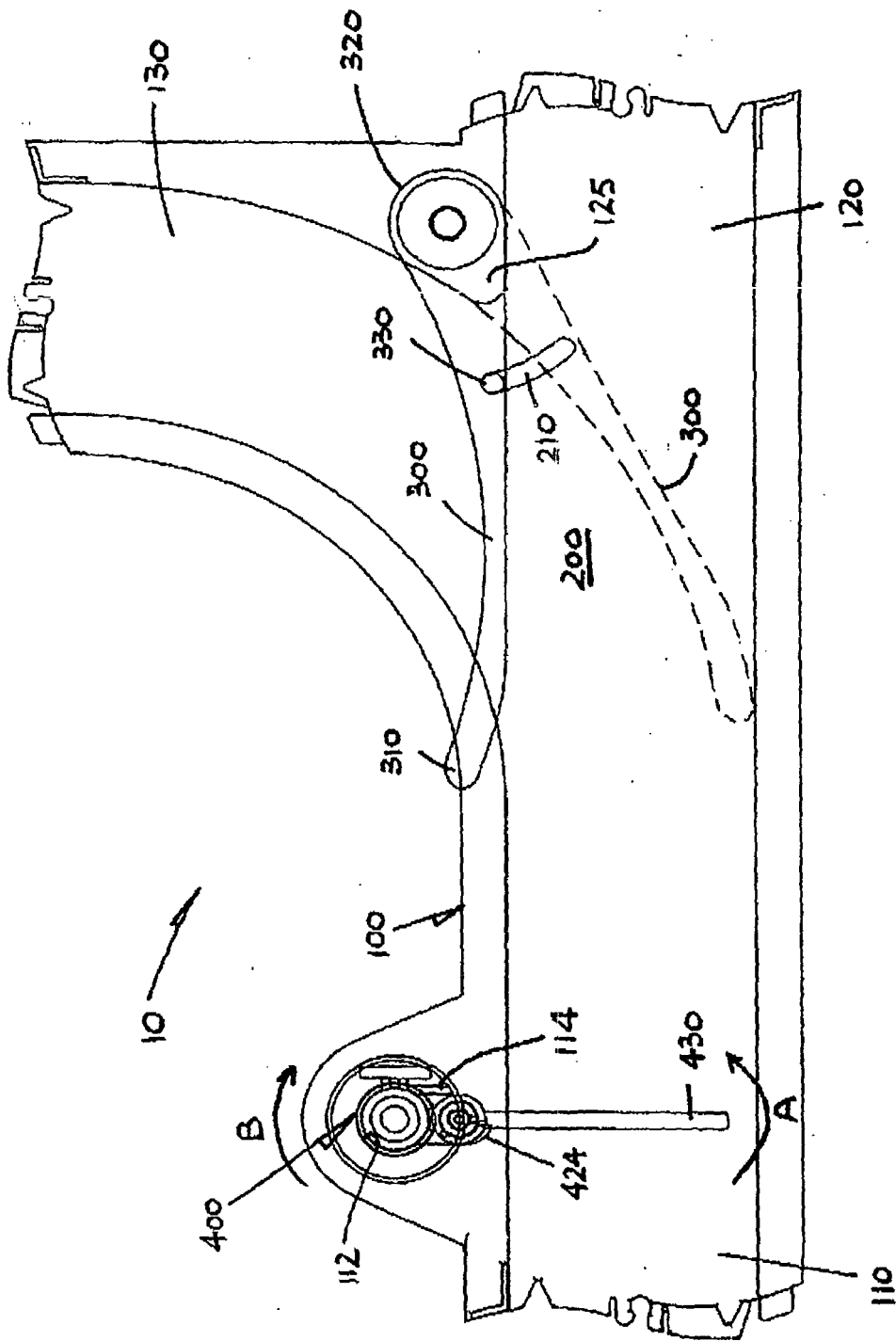


FIG. 1

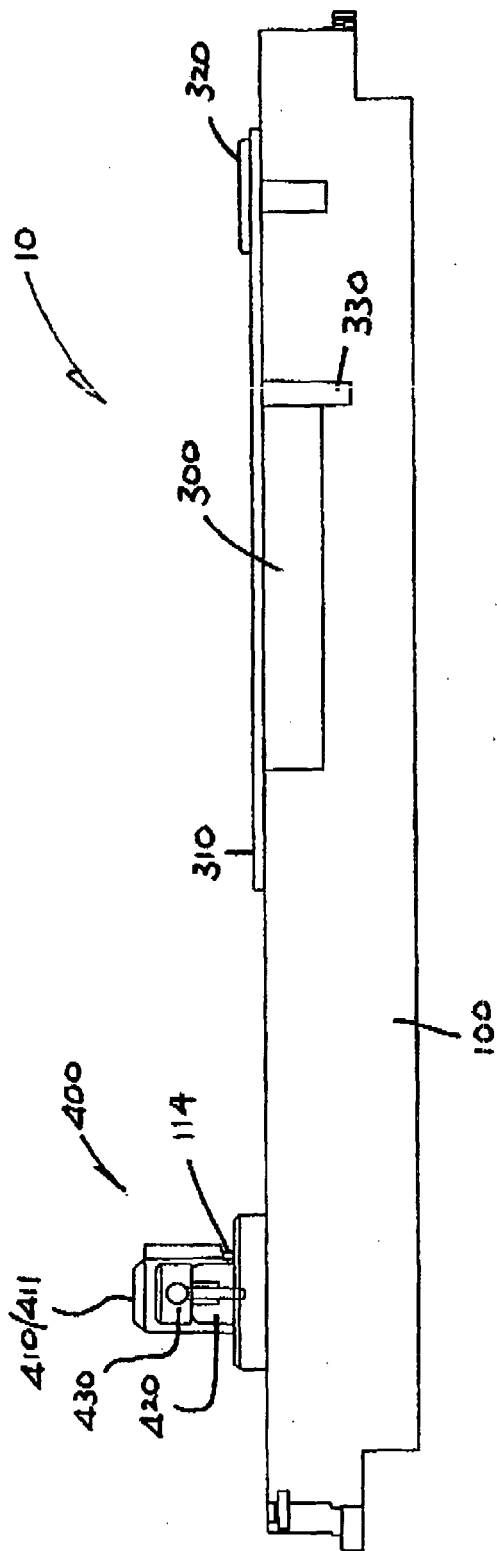
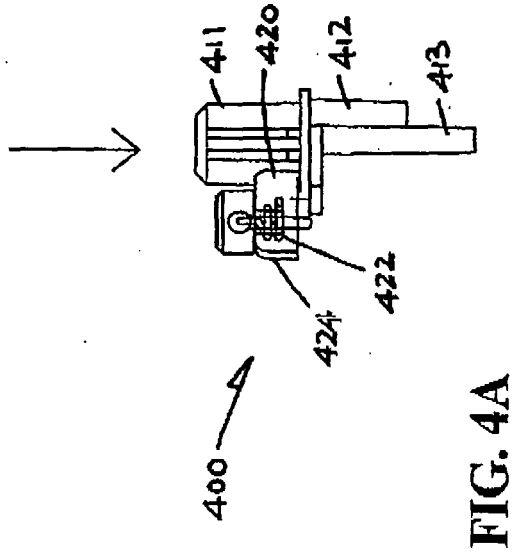
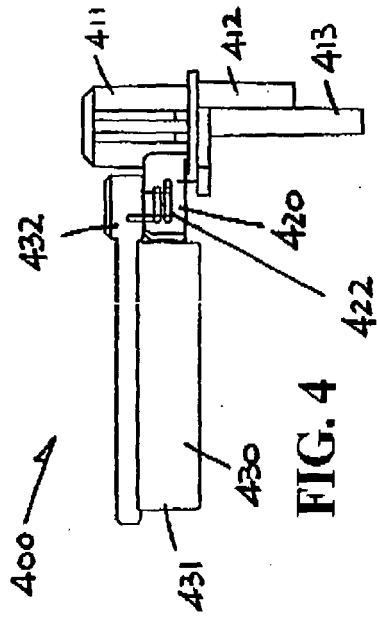
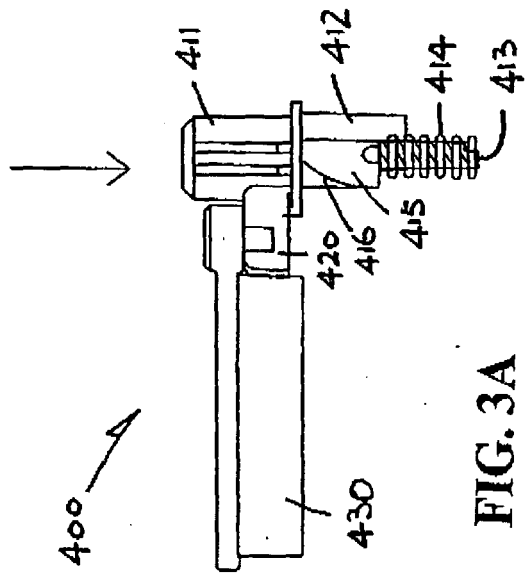
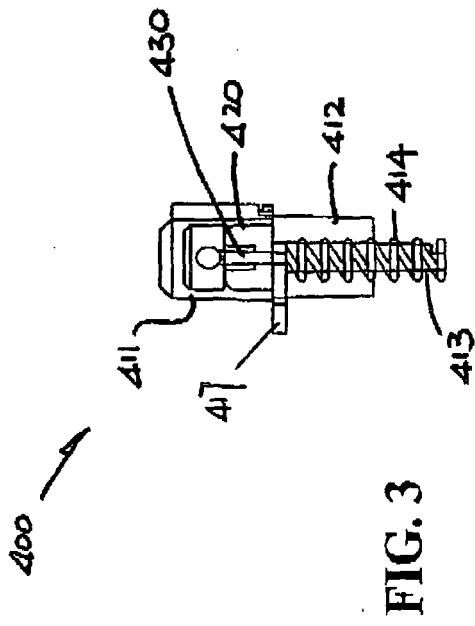


FIG. 2



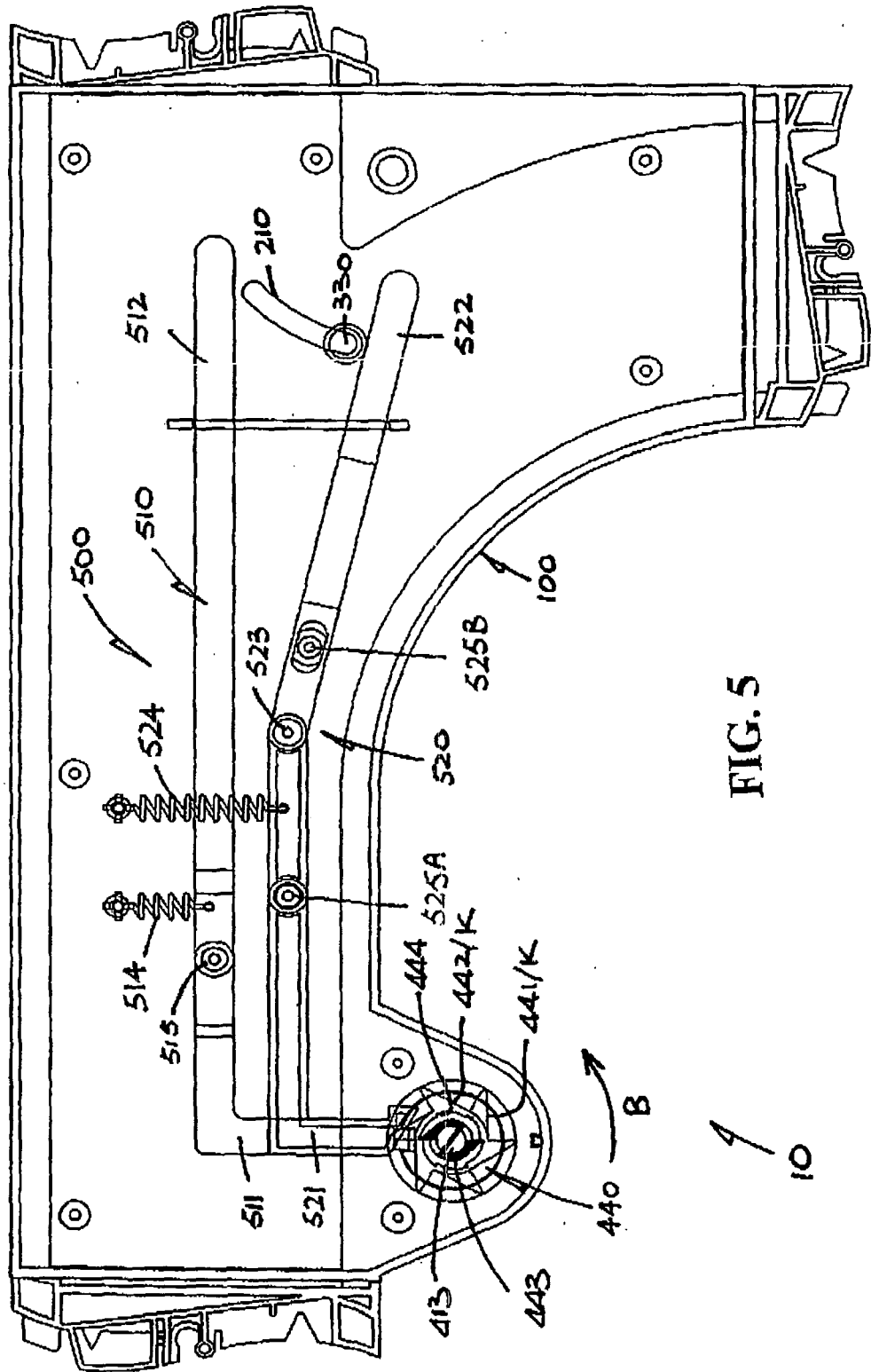


FIG. 5

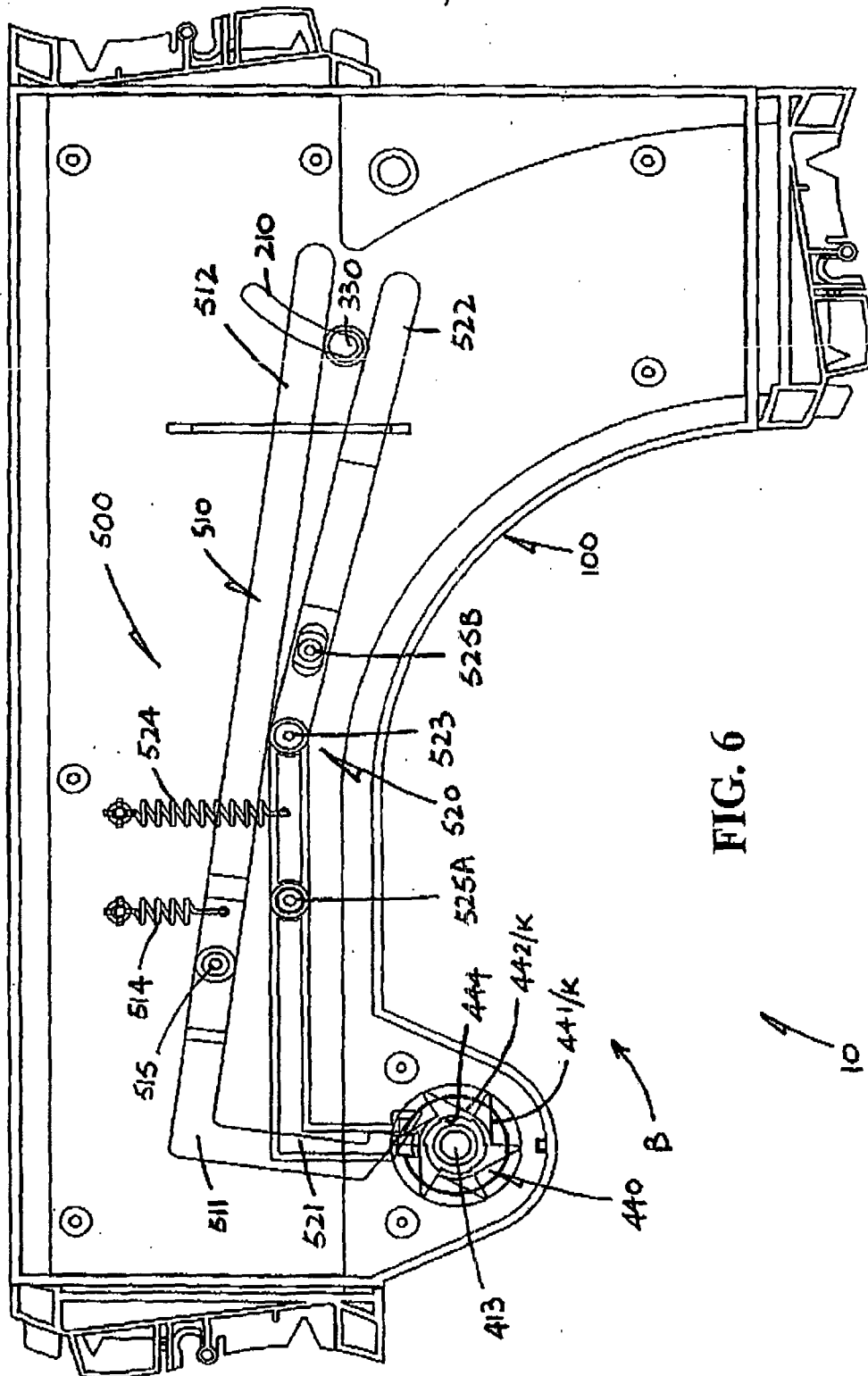
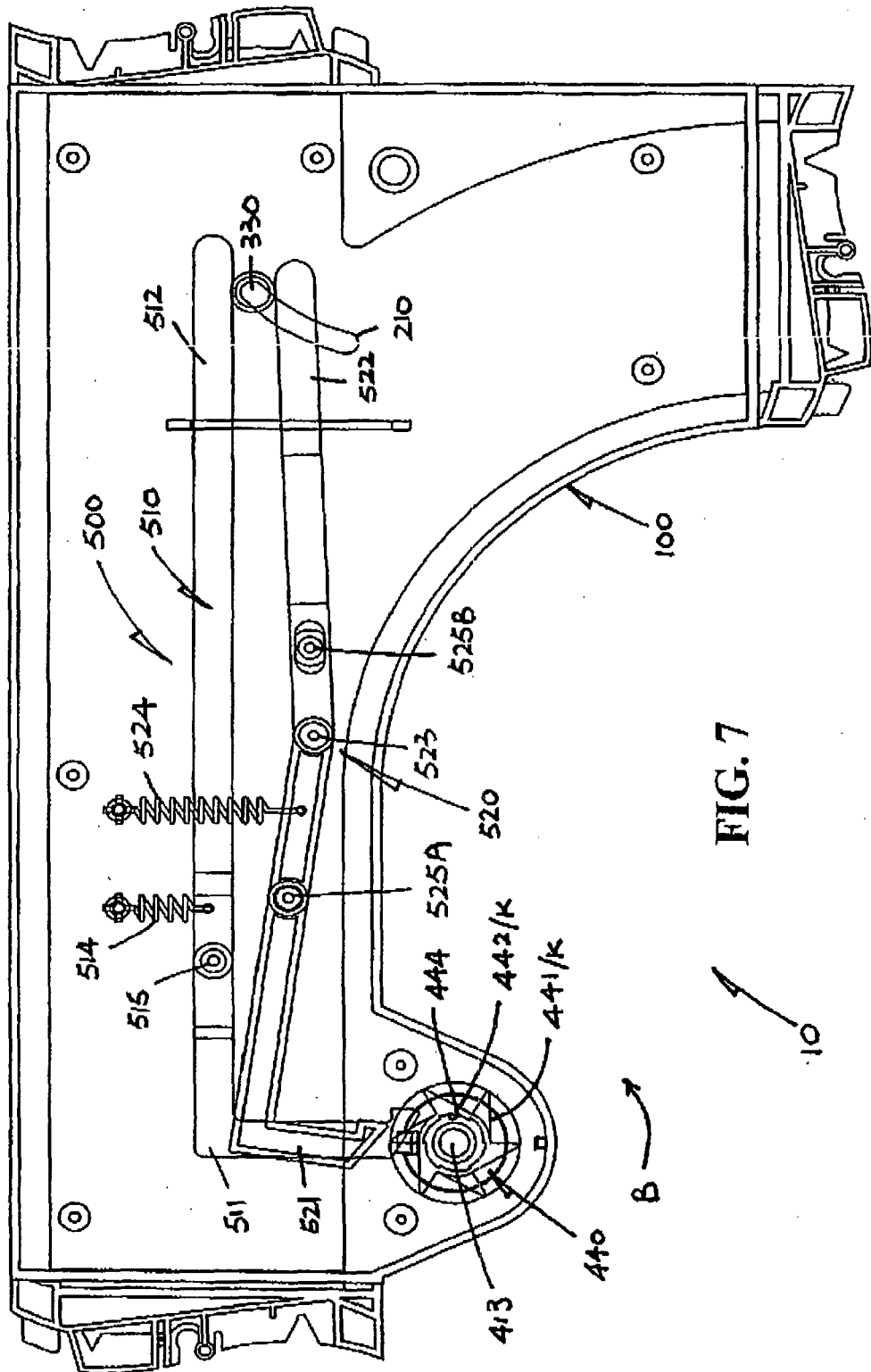


FIG. 6



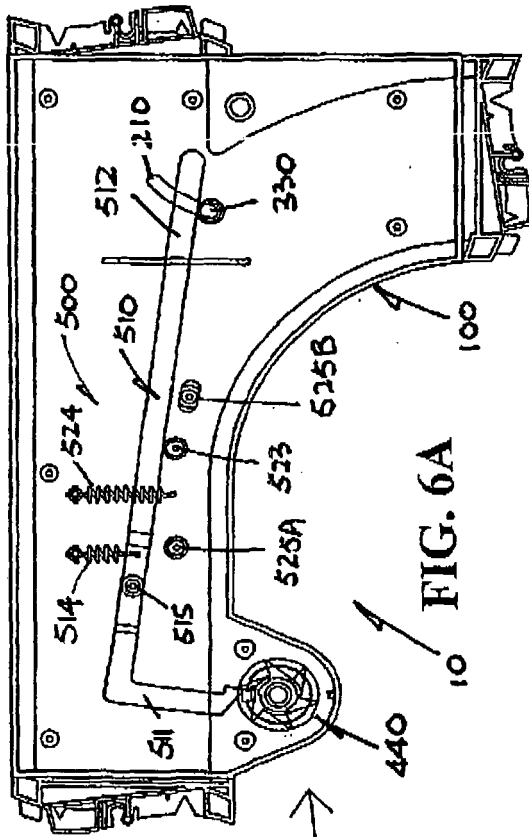


FIG. 6A

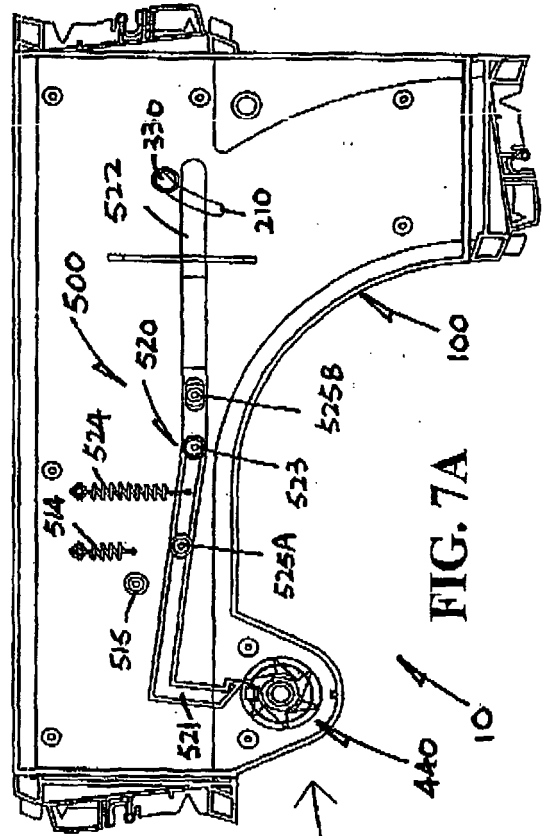
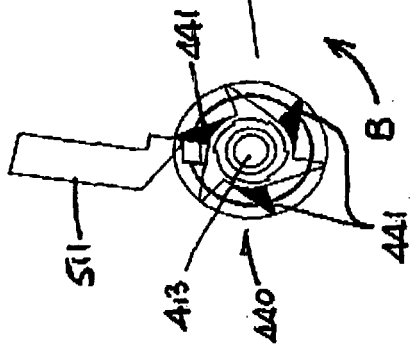
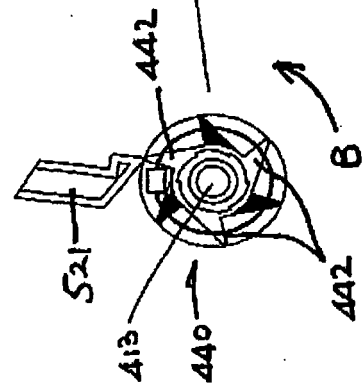


FIG. 7A





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	CA 2 503 401 A1 (WINKLER INTERNATIONAL, SA) 6 May 2004 (2004-05-06) * page 2, line 34 - page 3, line 34; figures 1-4,12 *	1-10, 12-17	A63H18/02 A63H19/32
A	----- US 3 496 674 A (JULIUS COOPER) 24 February 1970 (1970-02-24) * column 1, line 31 - column 4, line 5; figures 1-4 *	1-17	
A	----- US 2 121 696 A (HORN ERNST) 21 June 1938 (1938-06-21) * the whole document *	1-10	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A63H
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		5 October 2005	Brumme, I
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 25 2256

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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05-10-2005

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