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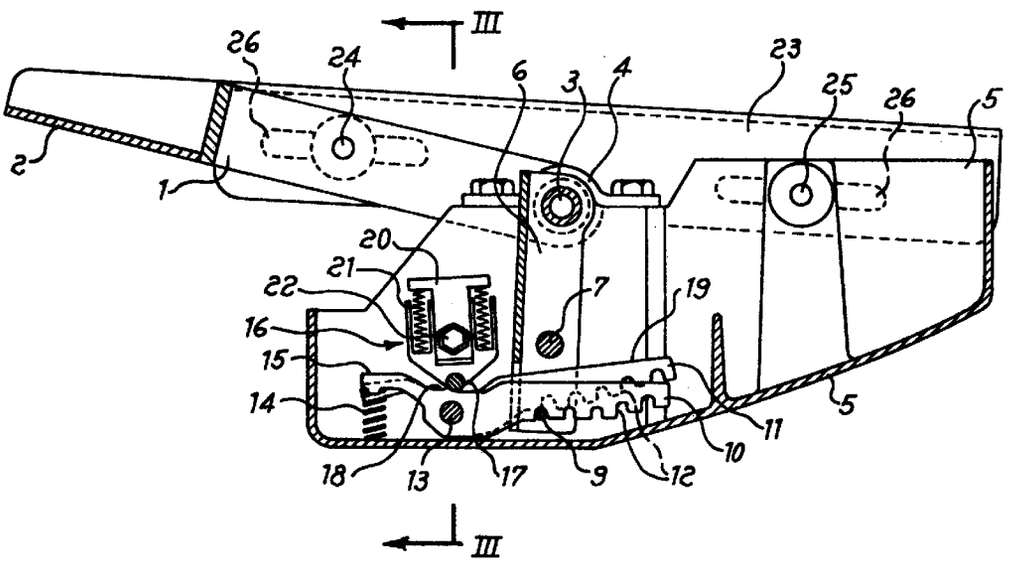
(54) A support for oscillating or synchronized chair

(57) A support for oscillating and inclinable chairs, comprising a device for stop the same inatilted position, comprising at least two toothed racks (10, 11) with staggered teeth, placed side by side and adapted to selectively engage a stop pivot (9); the distance between the teeth (12) of the racks placed side by side (10, 11) is equal to P/ n, where P is the pitch of the teeth of each rack and n is the number of racks placed side by side.

Fig.1



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Description

[0001] The invention relates to a support for oscillating or synchronized chairs, endowed with a device to stop the inclination in tilted positions, for the use In the chairs or armchairs. In the present specification the term chair also covers armchairs and any similar furniture, particularly for the office.

[0002] The term synchronized is applied to the chairs and armchairs in which the angle of oscillation of the back is different from that of the seat; the term oscillating is applied to chairs and armchairs in which seat and back tilt with the same angle.

[0003] State of the art chairs are known, for instance for the office, where the seat and the back are joined and can tilt simultaneously to allow the user to regulate the tilted position of the back and of the seat. They are equipped with a mechanism to stop at the tilted position formed by a rod toothed as a rack that is hooked to a pivot or body connected to the inclinable back.

[0004] This mechanism must be constructed with adequate dimensions of the pivot and of the rack, to resist the stresses of the load and for the wear and tear that results from the frequent insertion and disengagement of the pivot in the rack. The sizes of the teeth and of the pivot, therefore, could not be very small, such as would be necessary to achieve a fine adjustment of the blocked inclination position.

[0005] Therefore, the aforesaid mechanical limits, necessary for the integrity of the mechanism, don't allow the desired regulation of the inclination of the seat and of the back. The only regulation possible happens in few and very distant tilt positions.

[0006] An object of the present invention is to solve the aforementioned problems, by means of a mechanical stop device or the inclination of the back and the seat that allows much finer regulation, i.e. with a larger number of stop positions of the seat and of the back.

[0007] Such object is achieved by the present invention, which relates to a support for oscillating and inclinable chairs characterized according to Claim 1.

[0008] According to an aspect the invention, the distance between the teeth of the side by side racks is equal to P/ n, where P is the distance between the teeth and n is the number of racks placed side by side.

[0009] According to a further aspect the invention, said number of racks is more than two and they are oscillating on the same pivot.

[0010] According to another embodiment of the invention, the stop pivot is present at the end of an oscillating arm rigidly connected to an oscillating part to which the back is solidly fixed.

[0011] According to a further embodiment of the invention, each rack is equipped with a rear arm and reaction spring to force the meshing of the teeth with the stop pivot.

[0012] According to a further embodiment of the invention, on the upper side of each rack at least one cam prominence is provided and the rack is controlled by a selector acting on said cam to avoid or allow the meshing with said stop pivot.

[0013] The support for oscillating and inclinable chairs according to the present invention presents numerous advantages. In the first place, it allows the user to choice the desired inclination of the seat and of the back from a large range of positions.

[0014] The multiple racks on the same pivot and with staggered teeth allow the selection of a wide range of positions in that at least one of the racks meshes with the stop pivot in the position as desired by the user. The angular distance between of the positions of stop of the inclination can be reduced at will by increasing the number of rack places side by side. In fact, the more are the racks the lower are the differences between the teeth, maintaining always the pitch of the teeth in a single rack within acceptable values for the mechanical resistance.

[0015] The device is therefore strong and economical and is also easy to use due to the selector of the oscillation of the rack that allows to disconnect all the racks and maintain them lifted and disconnected from the stop pivot on which the spring pushes the same.

[0016] The invention will now be described in more detail by way of illustration and not of limitation, making reference to the enclosed drawings, in which:

- Fig. 1 is a longitudinal section of a support for oscillating and inclinable chairs, in the position in which the mechanical device stops the inclination;
- Fig. 2 is a plan view of the complete mechanism of the oscillating and inclinable chair or armchair;
- Fig. 3 is a cross-section along line III-III of figure 1, limited to the device for stopping the inclination;
- Fig. 4 is a longitudinal section of the stop device for the inclination with its selector in a position of free inclination;
- Fig. 5 is a view from the back of the racks with staggered teeth;
- Fig. 6 is a side view of the profile of a single rack.

[0017] As shown In figure 1 the support for oscillating and inclinable chairs comprises a fork 1 equipped with a base 2 for attachment of a seat back (not shown).

[0018] The fork 1 oscillates on a transversal pivot 3 by means of rotation supports 4 with which a body 5 is provided. An arm 6, oscillating within the body 5, is rigidly connected to the pivot 3 and carries a pivot reaction pin 7 for the inclination spring 8 (figure 2), as well as a stop pivot 9, in the portion of the arm 6 more far from the axis of oscillation.

[0019] At least two toothed racks 10 and 11, with staggered teeth 12, are arranged side by side and oscillating above the said stop pivot 9. The racks are joined in oscillation on a pivot 13, parallel but shifted with reference to the transversal pivot 3, said oscillation occurring against the action of a respective closure spring 14, act-

ing on a back arm 15 of each rack.

[0020] A selector 16, through a point 17, acts on all the racks between said pivot 13 and the respective arm 15, to control their oscillation freedom.

[0021] A cam prominence 18, on each upper side 19 of the racks, allows the selection of two racks positions: in the position of figure 1 the rack is free to oscille, while in that of figure 4 the rack is open with a release of the stop pivot 9 from all said racks.

[0022] Said selector 16 presents a point 17 sliding on a block 20, against the action of springs 21, which block 20 is in turn controlled in its oscillations from the outside of the body 5 by means of a horizontal rod 22.

[0023] The support for chair presents L-shaped irons 23 for fixing the seat (not shown), joined in oscillation, by means fo pivots 24 and 25, to said fork 1 and said body 5; the L-shaped irons have elongated with slots 26 to allow horizontal shiftings of the seat with reference to the back.

[0024] Figure 2 furthermore shows, a knob 27 actuating the pivot 25 for a horizontal shifting of the seat, a lever 28 actuating said rod 22 for controlling said selector 16 and a lever 29. The lever 29 controls, by means of a pivot 30, a finger lever 31 controlling a damper, which is adjustable in height and located in the chair support column 32.

[0025] The Inclination spring 8 is opposed by a seat 33 of the body 5, which could be made adjustable if necessary.

[0026] Figure 5 shows the actual pitch P of the adjoining teeth on a single rack, and the apparent pitch A of the racks placed side by side, equal to P/ n, where n is the number of the racks. As mentioned above, increasing the number of racks placed side by side the apparent pitch A decreases.

[0027] The support for oscillating and inclinable chairs according to the invention operates as follows: the user, acting on the lever 28 drives the rod 22 and varies the action of the selector 16 on the racks 10, 11, carrying said selector into the position as shown in fig. 4 (toward the springs 14), forcing the racks to rise, disengaging them from the stop pivot 9.

[0028] The user can now tilt the seat and the back into the desired position with the weight of his own body: the fork 1 turns with the pivot 2 on the supports 4 and, simultaneously, the arm 6 with the stop pivot 9 oscillates in the space underlying the racks, still raised as shown in figure 4. When the desired inclination is reached, the user moves the rod 22 carrying the selector 16 as in figure 1, beyond the cam prominence 18, where the point 17 no longer influences the oscillation of the racks. In this position the springs 14 push the racks downward; the rack with a tooth nearest the position of the stop pivot 9 lawers itself under the action of the spring 14 to lock on said pivot, preventing further oscillations of the chair. The remaining racks rest with their teeth on the pivot 9, without locking it.

[0029] The horizontal position of the seat is adjusted by acting on the knob 27 that controls the spring controlled pivot 25 to put the same in a disengagement position, so that the L-angle irons 23 could slide along the slots 26 on the pivots 24 and 25 of the fork 1 and body 5. When the desired position has been reached, the user releases the knob that stops, under the action of the spring wound on the pivot 25, the slide of the said L-angle irons and therefore of the seat with respect to the back.

Claims

1. A support for oscillating or synchronized chairs comprising a stop device to stop said chair oscillation in one position selected from a plurality of positions, characterized in that said stop device comprises at least two toothed racks (10, 11) placed side by side with staggered teeth, only one of said racks being able to engage itself with a stop pivot (9) in said select position.

2. A support for chairs according to Claim 1, characterized in that the distance (A) between the teeth (12) of the racks placed side by side (10, 11) is equal to P/n, where P is the pitch of the teeth in each rack and n is the number of side by side racks.

3. A support for chairs according to one of the preceding Claims, characterized in that said racks (10, 11) are pivotably mounted on a common pivot (13).

4. A support for chairs according to one of the the preceding Claims, characterized in that the number of said racks is more than two.

5. A support for chairs according to one of the preceding Claims, characterized in that said stop pivot (9) is sicured presenting on the end of an oscillating arm (6) rigidly connected to an oscillating component (1) to which the back is solidly fixed.

6. A support for chairs according to one of the preceding Claims, characterized in that each rack (10, 11) comprises a small rear arm (15) and a reaction spring (14) pushing against said arm (15) to engage the rack teeth (12) with said stop pivot (9).

7. A support for chairs according to one of the preceding Claims, characterized in that said racks (10, 11) are controlled by a selector (16) acting (via 17) on the rack upper surface (19) of them, to prevent or allow the engagement with said stop pivot (9).

8. A support for chairs according to one of the preceding Claims, characterized in that the upper surface (19) of each rack has at least a cam prominence (18).

9. A support for chairs according to one of Claims 7 or 8, characterized in that said selector (16), comprises a block (20) on which a point (17) radially slides against the action of at least one spring (21).

10. A support for chairs according to one of the preceding Claims, characterized in that it comprises a rod (22) operated from the outside for controlling said selector (16).

11. A support for chairs according to one of the preceding Claims, characterized in that comprises L-shaped irons (23) for supporting of the seat, equipped with slots (26) and sliding on pivots (24, 25) connected to said fork (1) and to said body (5), a column adjustable in height (32), and a finger lever (31) controlled from the outside for regulation of said column (32).

12. A support for chairs according to Claim 11, characterized in that one of said slide pivots (25) for said L-shaped irons (23) supporting said seat is axially movable, under a control from the outside (27), against the action of a spring, to allow the movement and stop of the horizontal slide of the said L-shaped irons.

13. An oscillating or synchronized chair or armchair, characterized in that it comprise a support according to one or more of the preceding Claims.

Fig.1

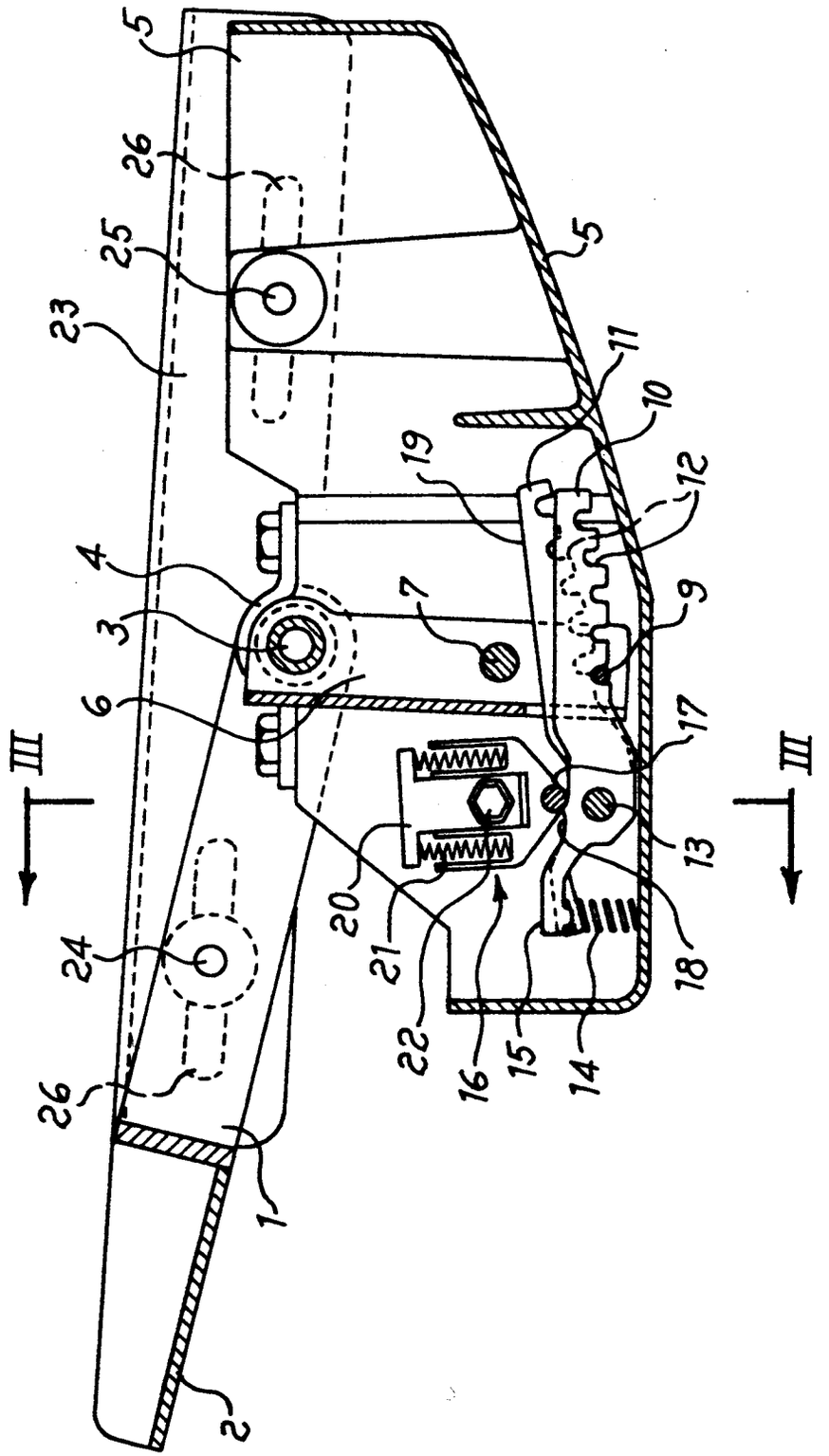
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Fig.2

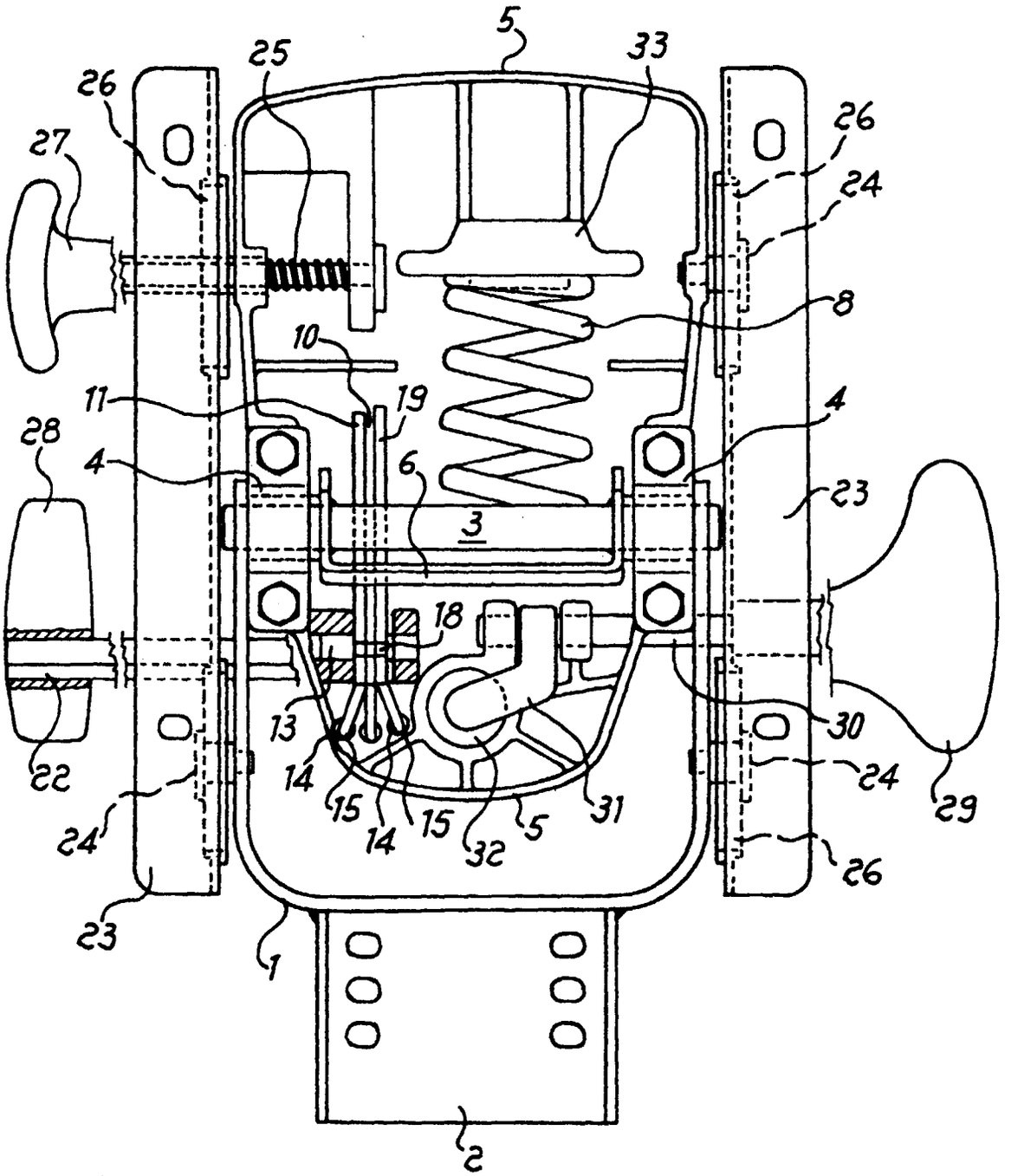
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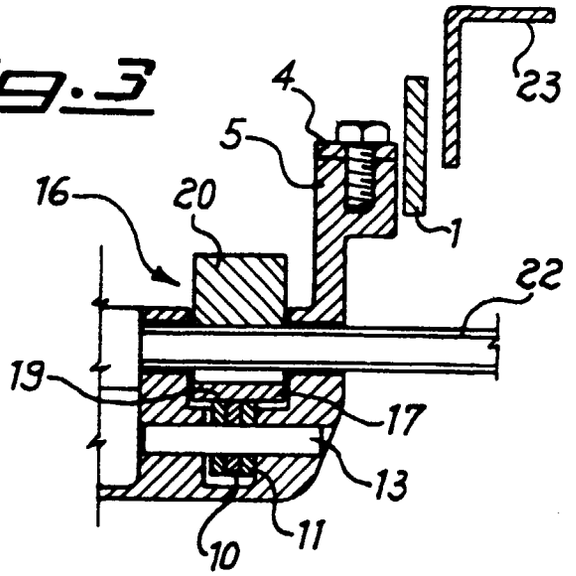
Fig.3



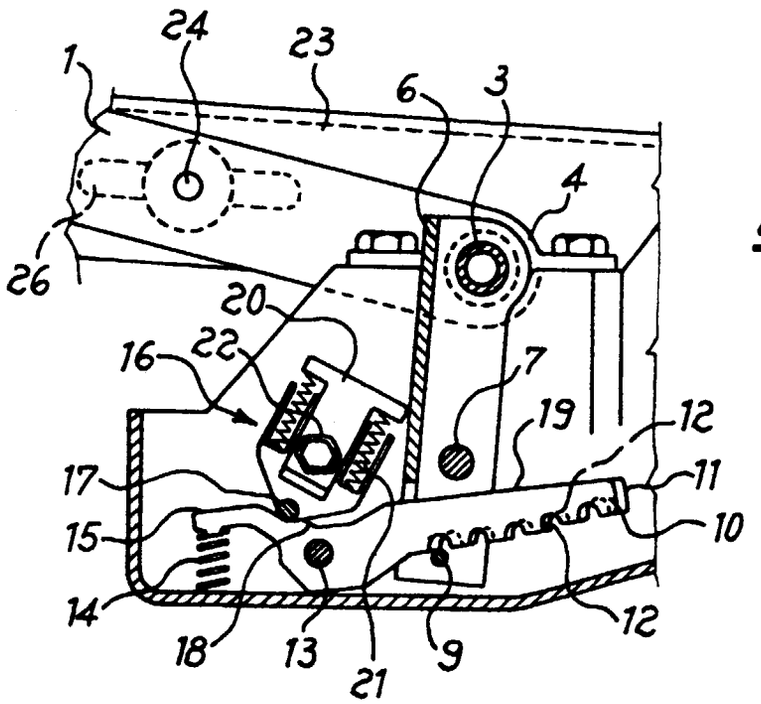


Fig.4

Fig.5

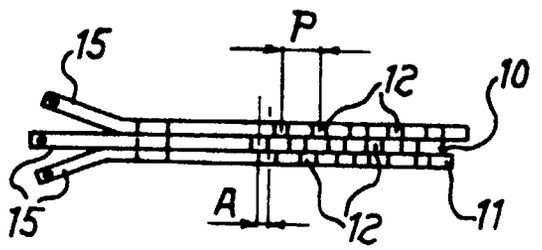


Fig.6