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(11) **EP 1 028 197 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**16.08.2000 Bulletin 2000/33**

(51) Int. Cl.<sup>7</sup>: **E01F 9/047**

(21) Application number: **00200388.7**

(22) Date of filing: **06.02.2000**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE**  
Designated Extension States:  
**AL LT LV MK RO SI**

(30) Priority: **10.02.1999 NL 1011259**

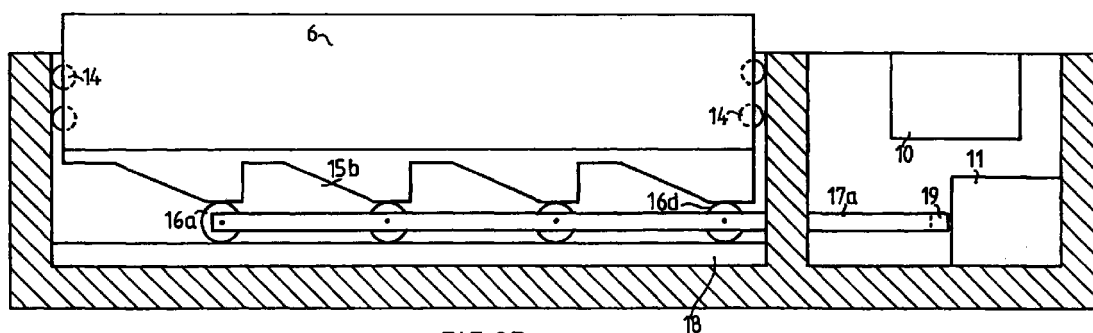
(71) Applicant: **Keijer, Edzo Hilbert  
9981 ND Uithuizen (NL)**

(72) Inventor: **Keijer, Edzo Hilbert  
9981 ND Uithuizen (NL)**

(54) **Traffic bump**

(57) The invention relates to a traffic bump, which is movably mounted into a road surface. In a non-activated state, the upper side of the traffic bump is located at the road surface level. In a first embodiment the activated traffic bump rises 10 cm above the road surface and

passes a message to a passing road-user. In a second embodiment, the activated traffic bump rises 30 cm above the road surface and effectively blocks all traffic.



**FIG.2B**

## Description

**[0001]** De invention relates to a traffic bump for operationally restricting a free passage for at least one vehicle for at least a part of a road surface.

**[0002]** Known traffic bumps have as a disadvantage that they are always present, even at moments they could actually be dispensed with. The traffic bump according to the invention obviates this drawback and is characterized in that the traffic bump is provided with movably mounted threshold means and with sensor means for determining at least one parameter of the vehicle, and that the sensor means are coupled to steering means, which are coupled to drive means for moving the threshold means. According to the inventive thought, a given criterion is used together with the sensor output for determining if the presence of the threshold means is desired and the threshold means are steered accordingly.

**[0003]** According to an aspect of the invention, it is never the intention to damage a passing vehicle, but rather to send a message to the driver that can hardly be ignored. A favourable embodiment of the invention is therefore characterized in that the threshold means comprise at least one profile crossing at least part of the road surface, a top of which is in a first operational position situated substantially level with the road surface and in a second operational position situated five to thirty cm above the road level.

**[0004]** A further favourable embodiment of the invention is characterized in that the threshold means comprise precisely two at least substantially parallel positioned profiles, at a mutual distance of forty to eighty cm. Experimentally it is found that two profiles located in such way substantially amplify the effect, without significantly increasing the production costs of the threshold means.

**[0005]** An important application of the inventive traffic bump is reducing the speed of a traffic flow at the entry of for example a village or a housing estate. The fixed traffic bumps that are in use now are without any doubt very effective, but they are also a nuisance to the motor car drivers who observe the maximum speed and who nevertheless have to decelerate in order to prevent themselves from being shaken up. Moreover this needless decelerating and accelerating again is a nuisance to the neighbours and it is detrimental to the environment. A favourable embodiment according to an aspect of the invention substantially obviates these disadvantages and is characterized in that the sensor means are arranged for measuring a velocity of an approaching vehicle. Only if the vehicle drives too fast, the profiles are brought into the second operational position, while other vehicles do not notice the presence of the traffic bump at all. De sensor means can be state of the art sensors; for example loops embedded in the road surface or a radar velocity meter.

**[0006]** An additional advantage of the inventive traf-

fic bump is that the exploitation costs are in general lower than the exploitation costs of a fixed traffic bump. Especially fixed traffic bumps ask for a regular maintenance, for renovating that part of the pavement at which every driver notices the bump and breaks. During the maintenance activities the traffic must be bypassed for a considerable time, which entails additional costs.

**[0007]** The inventive traffic bump on the contrary forces only fast driving cars to brake, which make only a small percentage of the traffic involved, as a result of which the road surface suffers less. Is a periodic maintenance necessary, then this can take place substantially without hampering the traffic, because the most vulnerable parts, the steering means and partly also the drive means, are located beside the road surface. Is a complete overhaul necessary, then the entire traffic bump can be hoisted out of the road surface, after which the opening can be temporarily closed with a concrete lid. This operation can take place within some minutes.

**[0008]** Another very important field of application of the inventive traffic bump is generating warnings to potential ghost-drivers at the moment they intend to drive into the wrong lane. A favourable embodiment according to an aspect of the invention which realizes this is characterized in that the sensor means are arranged for determining a direction of an approaching vehicle. This can be done with state of the art sensors, like loops in the road surface.

**[0009]** Another very important field of application of the inventive traffic bump is found in places where a road, lane or strip must be closed down, for example if an amount of money must be paid before the vehicle may proceed on its way, like at a filling station, a toll bridge or a car park. A favourable embodiment of the invention realizing this is characterized in that the sensor means are arranged for verifying an authorization of a vehicle for passing the passage. A parking meter, a cash operator or an electronic reading apparatus detecting a chip can for example give the authorization.

**[0010]** Another favourable embodiment of a traffic bump according to the invention is characterized in that the threshold means are operationally mounted in a concrete housing, partly situated in the road surface and partly beside the road surface. Preferably, the steering means and the drive means are located then beside the road surface, such that it is not necessary to block the road during maintenance. The threshold means are necessarily located in the road surface, but they can be removed easily and quickly from it, after which the concrete housing can be closed temporarily with a concrete cover member.

**[0011]** Another favourable embodiment of the invention is characterized in that the drive means comprise an electromotor and transmission means, for realizing under operational conditions an at least substantially vertical movement of the threshold means.

**[0012]** The invention also relates to a method for obstructing a free passage for a vehicle across at least

a part of a road surface. The inventive method is characterized in that for each vehicle at least one parameter is determined and that dependent upon this parameter a traffic bump is or is not moved upwards from the road surface to a level of five to thirty cm.

**[0013]** A favourable realization of the inventive method is characterized in that the parameter is a velocity, a direction or a verification of an authorization of the vehicle.

**[0014]** The invention will now be explained in more detail with reference to the following figures, in which:

- Fig. 1 represents in top view a possible embodiment of the traffic bump;  
 Fig. 2A represents in side view a possible embodiment of the traffic bump in a non-activated position;  
 Fig. 2B represents in side view a possible embodiment of the traffic bump in an activated position;  
 Fig. 3 represents more in detail how a profile, a wheel and a rail cooperate.

**[0015]** Fig. 1 represents in top view a possible embodiment of the traffic bump, housed in a concrete container having two compartments, the first part 1 of which is embedded in the road surface 2 and the second part 3 of which projects into the verge 4. In first part 1 two profiles 5,6 are placed, an upper side of which is at the same level as the road surface 2 if the system is in a state of rest. A concrete plate 7, provided with two recesses 8,9, in which two crane hooks are flush mounted, covers the remaining part of the opening. In this state the traffic bump forms no obstruction whatsoever to a passing vehicle. In second part 3 a switch box 10 is mounted, connected to a sensor, not shown here, which can measure the speed of an approaching vehicle. The sensor may be a pair of loops, embedded in the road surface at a known distance or a radar velocity meter. If the speed of the vehicle is larger than a predetermined speed, then switch box 10 steers an electromotor 11, which pushes the profiles 5,6 via transmission means 12 for example 10 cm. out of the road surface, in such a way that they constitute a double threshold for the vehicle. In order to guide profiles 5,6 and to divert the forces that are generated, steel strips 13 are screwed to first part 1 and concrete plate 7. Possible inaccuracies in the dimensions of the concrete part are compensated when necessary with filling plates. The butts of profiles 5,6 are provided with wheels 14, which can roll against an inside of first part 1 if profiles 5,6 move in an upward or downward direction.

**[0016]** Fig. 2a represents in side view a possible embodiment of the traffic bump in a non-activated position, with one side wall of the concrete container removed for the sake of clearness. Profile 6 is in this embodiment on its lower end provided with four recesses 15a,15b,15c,15d, in which in the non-acti-

vated position four wheels 16a,16b, 16c,16d are placed. The upper side of profile 6 is now at the same level as the road surface. Wheels 16a,16b,16c,16d are mutually connected by strips 17a,17b, of which only strip 17a is visible here, with which they can be pulled into the direction of second part 3 with the aid of a wire shaft 18 which is connected to electromotor 11. During this movement wheels 16a,16b,16c,16d roll along a rail 18 which is mounted onto the floor of first part 1 and profiles 6 start to move in an upward direction as soon as wheels 16a,16b, 16c,16d reach the oblique sides of the recesses 15a,15b,15c,15d.

**[0017]** Strips 17a,17b, belonging to profile 6 and strips 17c,17d, belonging to profile 5, are mutually connected by a bridge 19, which is in a central position internally threaded for co-operating with wire shaft 18, such that all strips 17a,17b,17c,17d will move simultaneously. Bridge 19 is visible in top view in Fig. 1.

**[0018]** Fig. 2b represents in side view a possible embodiment of the traffic bump in an activated position. The upper side of profile 6 now protrudes above the road surface and the depth of the four recesses 15a,15b,15c,15d determines its height. Wheels 16a,16b,16c,16d are completely pulled out of the recesses, which substantially prevents the forces exerted on profile 6 to be transferred to wire shaft 18 and electromotor 11.

**[0019]** Fig. 3 represents more in detail how a profile 6, wheel 16, strips 17a,17b and rail 18 co-operate. Profile 6 has a width of for example 10 cm. Under profile 6 and over the entire length a smaller profile 20 is welded, with a width that is equal to the width of rail 18, for example 4 cm. Wheel 16 is on both sides provided with a flange 21, which prevents wheel 16 from rolling off rail 18 and which also prevents smaller profile 20 from rolling off wheel 16. On an axis 22 of wheel 16 the strips 17a, 17b are mounted and fixed with two nuts 23a,23b.

**[0020]** In the embodiment shown here the smaller profile 20 is placed beneath profile 6 in order to create room for wheel 16, because it must be possible for profile 6 to move close to the sidewall of the concrete container. In an alternative embodiment, it is possible to dispose of smaller profile 20 and to give rail 18 the same width as profile 6. In that embodiment the side wall of the concrete container must be provided with a recess, running along the entire length of the concrete container in order to let wheel 16 pass.

**[0021]** In the embodiment shown here the transmission means with which the rotating movement of the electromotor 11 is changed into a desired linear motion of the strips 17a,17b, 17c 17d, is constructed as a wire shaft 18 and a thread in bridge 19 co-operating with it. For a skilled man it will be clear that it is also possible to realize the transmission with a drive rod, well known in the art, eccentrically connected to a disc, which disc in turn can be rotated by electromotor 11. It is also possible to couple the strips 17a,17b,17c 17d to one or more hydraulic cylinders, in which case electromotor 11

drives a pump which delivers the necessary oil pressure for moving the traffic bump.

10. Method according to claim 9, characterized in that the parameter is a velocity, a direction or a verification of an authorization of the vehicle.

## Claims

1. Traffic bump for operationally restricting a free passage for at least one vehicle for at least a part of a road surface, characterized in that the traffic bump is provided with movably mounted threshold means and with sensor means for determining at least one parameter of the vehicle, and that the sensor means are coupled to steering means, which are coupled to drive means for moving the threshold means. 5 10
2. Traffic bump according to claim 1, characterized in that the threshold means comprise at least one profile crossing at least part of the road surface, a top of which is in a first operational position situated substantially level with the road surface and in a second operational position situated five to thirty cm above the road level. 15 20
3. Traffic bump according to claim 2, characterized in that the threshold means comprise precisely two at least substantially parallel positioned profiles, at a mutual distance of forty to eighty cm. 25
4. Traffic bump according to claim 1, characterized in that the sensor means are arranged for measuring a velocity of an approaching vehicle. 30
5. Traffic bump according to claim 1, characterized in that the sensor means are arranged for determining a direction of an approaching vehicle. 35
6. Traffic bump according to claim 1, characterized in that the sensor means are arranged for verifying an authorization of a vehicle for passing the passage. 40
7. Traffic bump according to one of the previous claims, characterized in that the threshold means are operationally mounted in a concrete housing, partly situated in the road surface and partly beside the road surface. 45
8. Traffic bump according to claim 7, characterized in that the drive means comprise an electromotor and transmission means, for realizing under operational conditions an at least substantially vertical movement of the threshold means. 50
9. Method for obstructing a free passage for a vehicle across at least a part of a road surface, characterized in that for each vehicle at least one parameter is determined and that dependent upon this parameter a traffic bump is or is not moved upwards from the road surface up to a level of five to thirty cm. 55

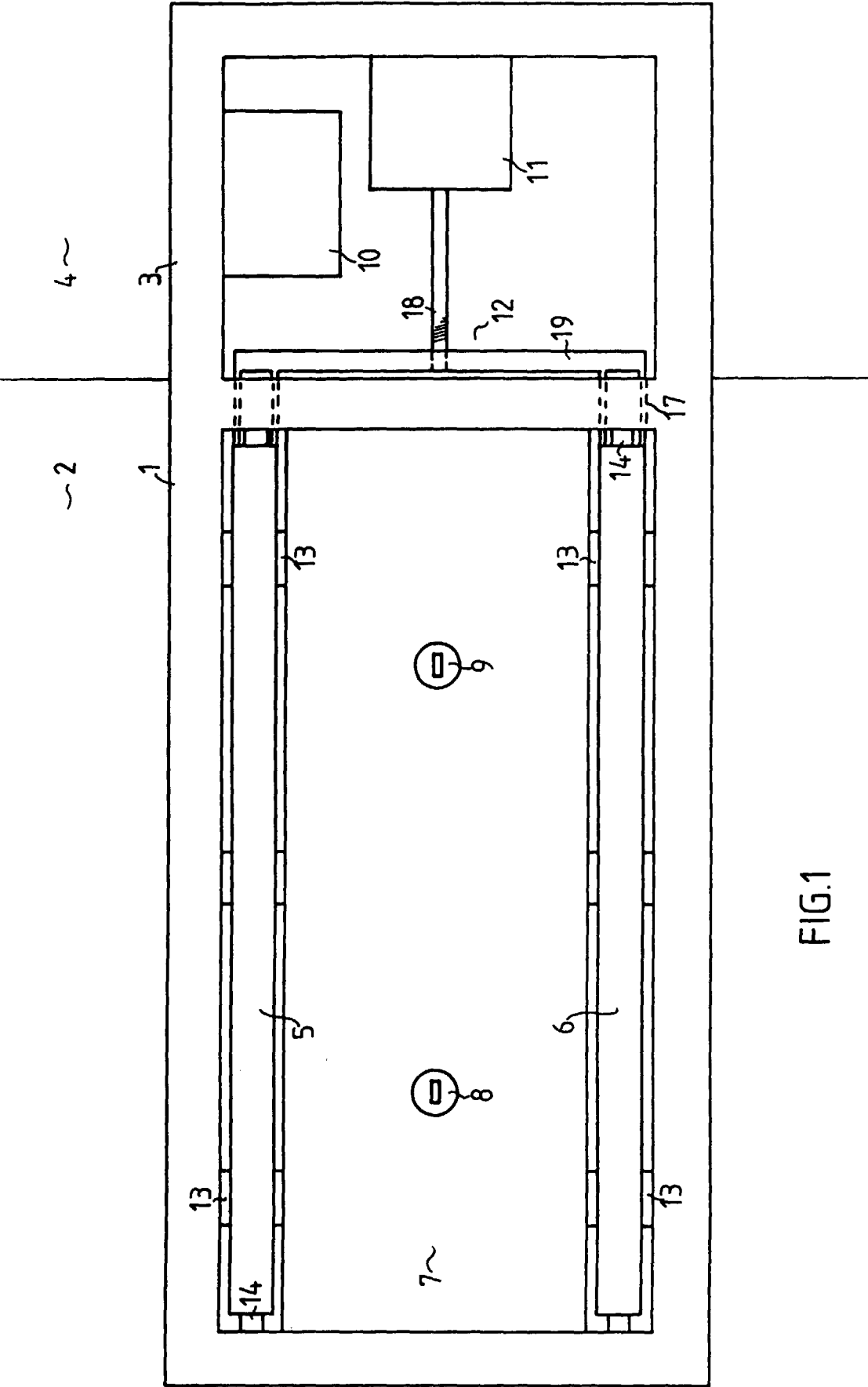


FIG.1

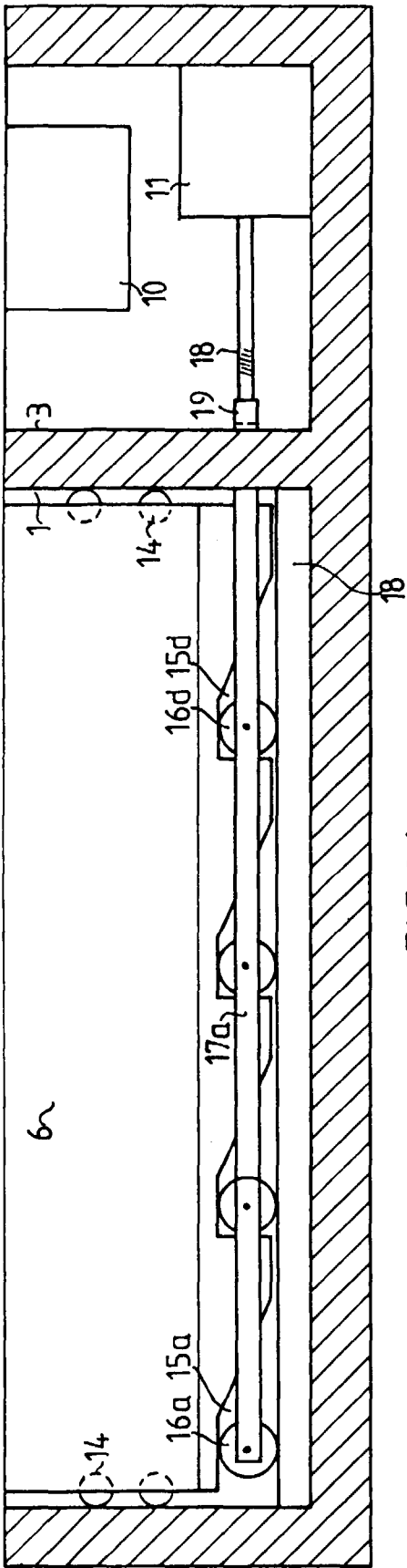


FIG. 2A

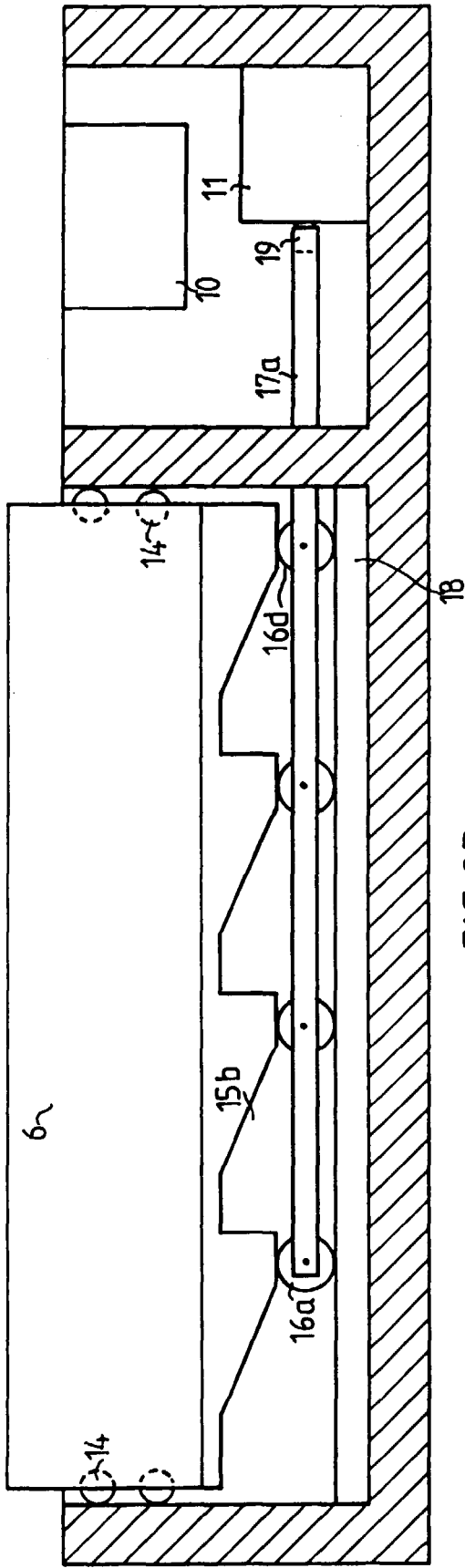


FIG. 2B

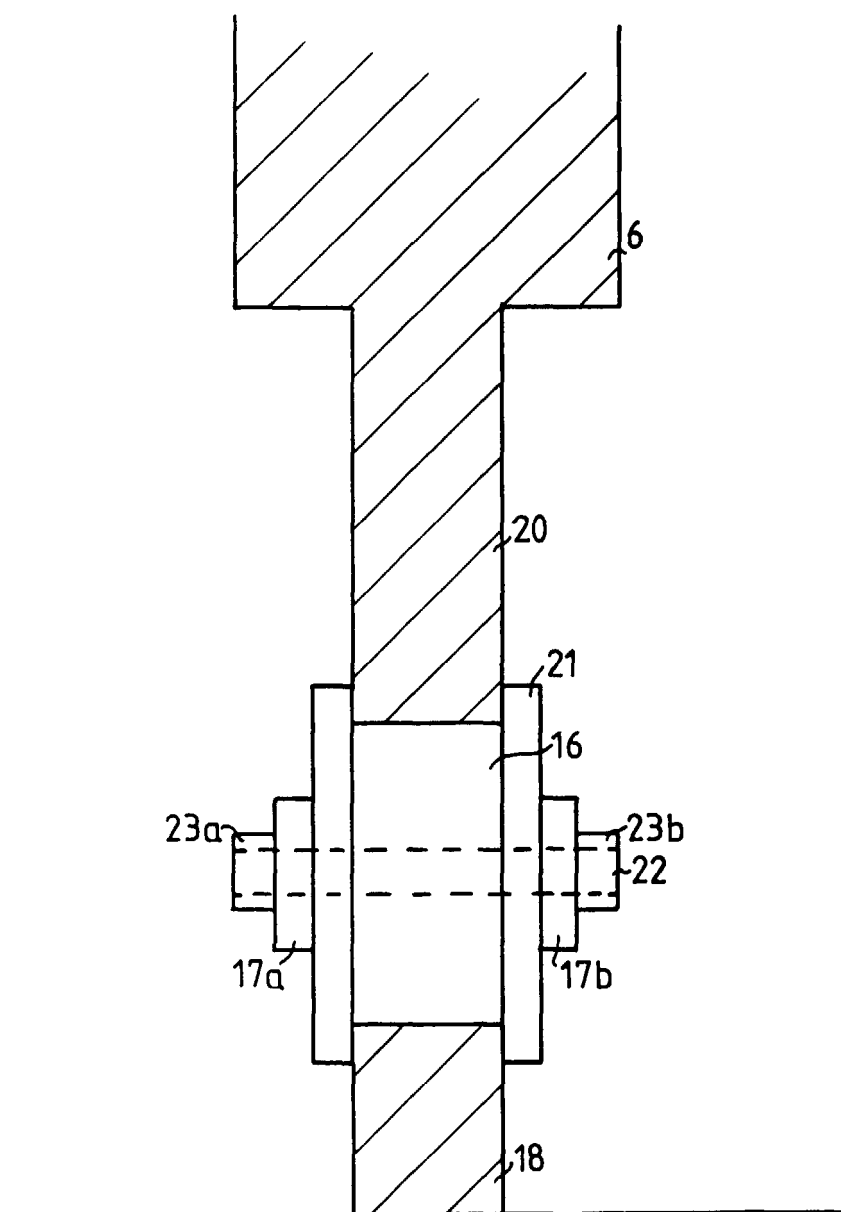


FIG.3