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71 Applicant: FORD MOTOR COMPANY LIMITED
Eagle Way
Brentwood Essex CM13 3BW(GB)

84 Designated Contracting States:
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71 Applicant: FORD-WERKE AKTIENGESELLSCHAFT
Ottoplatz 2 Postfach 21 03 69
D-5000 Köln 21(DE)

84 Designated Contracting States:
DE

71 Applicant: FORD FRANCE SOCIETE ANONYME
344 Avenue Napoléon Bonaparte B.P. 307
F-92506 Rueil Malmaison Cedex(FR)

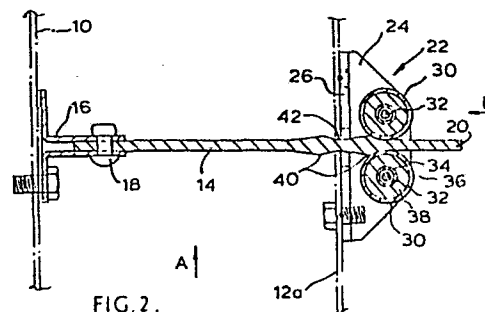
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FR

72 Inventor: Knaggs, Peter
20 St. Stephens Road
Cold Norton Essex(GB)

74 Representative: Messulam, Alec Moses et al,
A. Messulam & Co. 24 Broadway
Leigh on Sea Essex SS9 1BN(GB)

54 Door check mechanism.

57 A door check mechanism uses elastic bushes 30 mounted for rotation on either side of an arm 14. As the door 12a, 12b is opened or closed, the arm moves past the bushes. The arm 14 has bumps 40 on it and the bushes 30 have to yield to allow the bumps on the arm to pass. The bushes have inner and outer rigid sleeves 34, 36 with a resilient core 38 between them. The resilient core provides the necessary resilience to hold the arm in its checked positions.



Door check mechanism

This invention relates to a door check mechanism for holding a door in a predetermined open position. Such mechanisms are conventionally used on motor car doors, and the mechanism may provide for more than one
5 predetermined open position. The invention is not however restricted to a motor car application.

Door check mechanisms are known where an arm runs between two surfaces which are resiliently urged towards one another. The arm has depressions on it (which may be
10 defined between raised portions on the arm) and when the resiliently urged surfaces enter a depression, the arm is held. Either the arm or the resiliently urged surfaces may be mounted on the door, with the other component being mounted on the door frame.

15 As resiliently urged surfaces, spring-loaded rollers have been used, with a body of rubber being used to provide the spring loading. Because of space constraints, the rollers have been small and have tended to jam instead of rotating. The body of rubber has
20 needed to have a high spring rate and the rubber materials consequently available have often been adversely affected by high temperatures which occur when car bodies are painted and which result in an undesired alteration of the spring rate.

25 According to the present invention, there is provided a door check mechanism to be mounted between two mutually hinged components, one of which is a door and the other of which is a door frame, the mechanism comprising an arm to be fixed to one component, which arm has a
30 depression at a point along its length, and a roller unit to be fixed to the other component, the roller unit including a roller which has a rigid outer sleeve and is mounted on a central spindle with a resilient core

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between the sleeve and the spindle with the axis of the roller at right angles to the direction of relative movement between the two components and the arm and the roller unit being adapted to be fixed to the respective components such that the arm passes through the roller unit, the resilient core supporting the roller sleeve being able to deform resiliently to allow the roller to pass out of the depression.

There are preferably two parallel rollers, one either side of the arm, and a depression on each side of the arm. There may be more than one depression or pair of depressions on the arm to provide more than one check position.

Preferably the arm is mounted on the door frame and the roller unit is mounted on the door.

With the rollers as set forth above, a relatively large roller radius is obtained which produces a relatively large mechanical advantage when the roller encounters the edge of the depression which encourages the roller to turn. A relatively large body of rubber can form the resilient core resulting in the use of a lower spring rate than would otherwise be the case. This broadens the range of resilient materials which could be used to include relatively stable materials.

The rollers used are of the type already widely used, particularly in the automotive field, and known as flexible bushes or elastic bushes. These rollers or bushes are made, for example, by the company Metallastik Limited.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:

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Figure 1 is a horizontal section through a motor vehicle door and door frame with a check mechanism in accordance with the invention;

5 Figure 2 is an elevation of the check mechanism shown in Figure 1;

Figure 3 is a view of the check mechanism of Figure 2, looking in the direction of the arrow A; and

10 Figure 4 is a view of the check mechanism of Figure 2, looking in the direction of the arrow B.

Part of a door frame 10 is shown in Figure 1 in conjunction with part of a door made up of an inner panel 12a and an outer (skin) panel 12b. The door is shown in solid lines in a closed position and in dotted lines in an open position.

An arm 14 is mounted on the door frame 10 through a bracket 16 and a pivot 18. As seen from above in Figure 1, the arm 14 is of constant width and ends in an enlarged portion 20.

20 A roller unit 22 is mounted inside the inner skin 12a of the door.

The roller unit 22 comprises a yoke 24 which has a base 26 fixed to the door panel and an aperture 28 in the base to allow the arm 14 to pass through. Two rollers 30 are supported on parallel spindles 32 between opposite cheeks of the yoke.

The rollers each have a central metal sleeve 34, an outer metal sleeve 36 and a resilient rubber core 38.

The arm 14, when seen in side view, has two pairs of

bumps 40 which define between them a depression 42. The sides of the bumps form cam surfaces on which the rollers 30 ride.

5 As the door is opened, the arm will pass between the rollers 30. Once the door has been opened far enough to allow the rollers to pass over the first set of bumps 40, it will be held in that position by the rollers until a force is applied to the door sufficient to deform the resilient cores of the rollers and to allow
10 the rollers to ride over the bumps.

In the embodiment shown, there are two sets of bumps. The first check position will occur when the rollers lie between the two sets. The second check position will occur when the rollers have passed over both sets of
15 bumps and are restrained from further outward movement by contact between the enlarged portion 20 of the arm and the yoke 22.

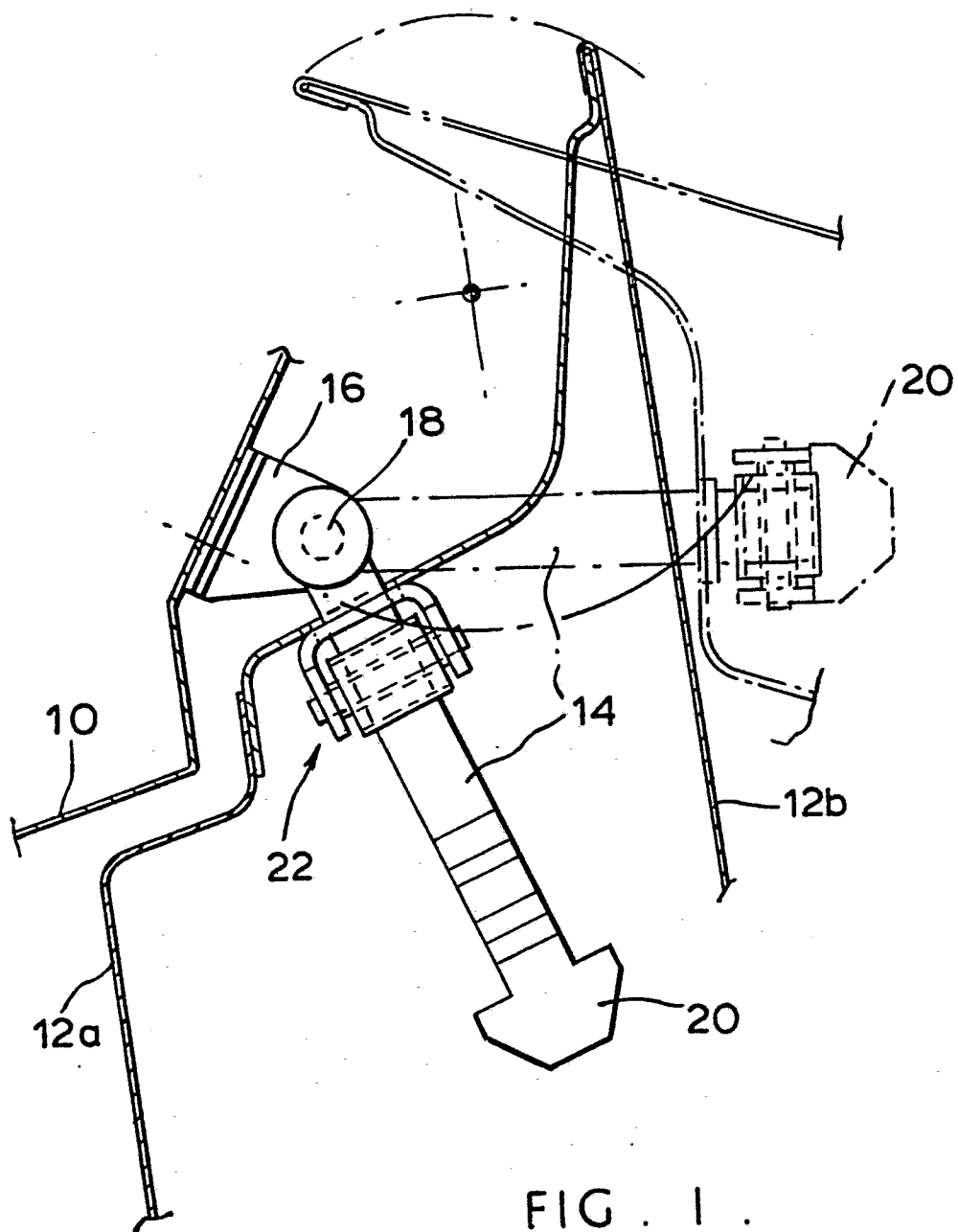
The resilient material in the core 28 will be chosen primarily to have the correct spring rate to give the
20 desired resistance to movement of the arm past the check positions but also to be stable under the temperature conditions which occur in paint ovens.

The inner and outer sleeves 34 and 36 can be of any suitable material, not necessarily metal. The inner
25 sleeve in particular may be of a material which will form a good bearing surface against the spindle 32 so that the roller can rotate easily.

CLAIMS

1. A door check mechanism to be mounted between two mutually hinged components, one of which is a door (12a) and the other of which is a door frame (10), the
5 mechanism comprising an arm (14) to be fixed to one component (10), which arm has a depression (42) at a point along its length, and a roller unit (22) to be fixed to the other component (12a), the roller unit (22) including a roller (30) which has a rigid outer
10 sleeve (36) and is mounted on a central spindle (32) with a resilient core (38) between the sleeve (36) and the spindle (32) with the axis of the roller at right angles to the direction of relative movement between the two components and the arm (14) and the roller unit (22)
15 being adapted to be fixed to the respective components such that the arm (14) passes through the roller unit (22), the resilient core (38) supporting the roller sleeve (36) being able to deform resiliently to allow sleeve (30) to pass out of the depression (42).
- 20 2. A mechanism as claimed in Claim 1, wherein there are two parallel rollers, one either side of the arm, and a depression on each side of the arm.
3. A mechanism as claimed in Claim 1 or Claim 2, wherein there is more than one depression or pair of depressions on the arm to provide more than one check
25 position.
4. A mechanism as claimed in any preceding claim, wherein the arm is mounted on the door frame and the roller unit is mounted on the door.

5. A mechanism as claimed in any preceding claim, wherein the rollers used are of the type already widely used, particularly in the automotive field, and known as flexible bushes or elastic bushes.



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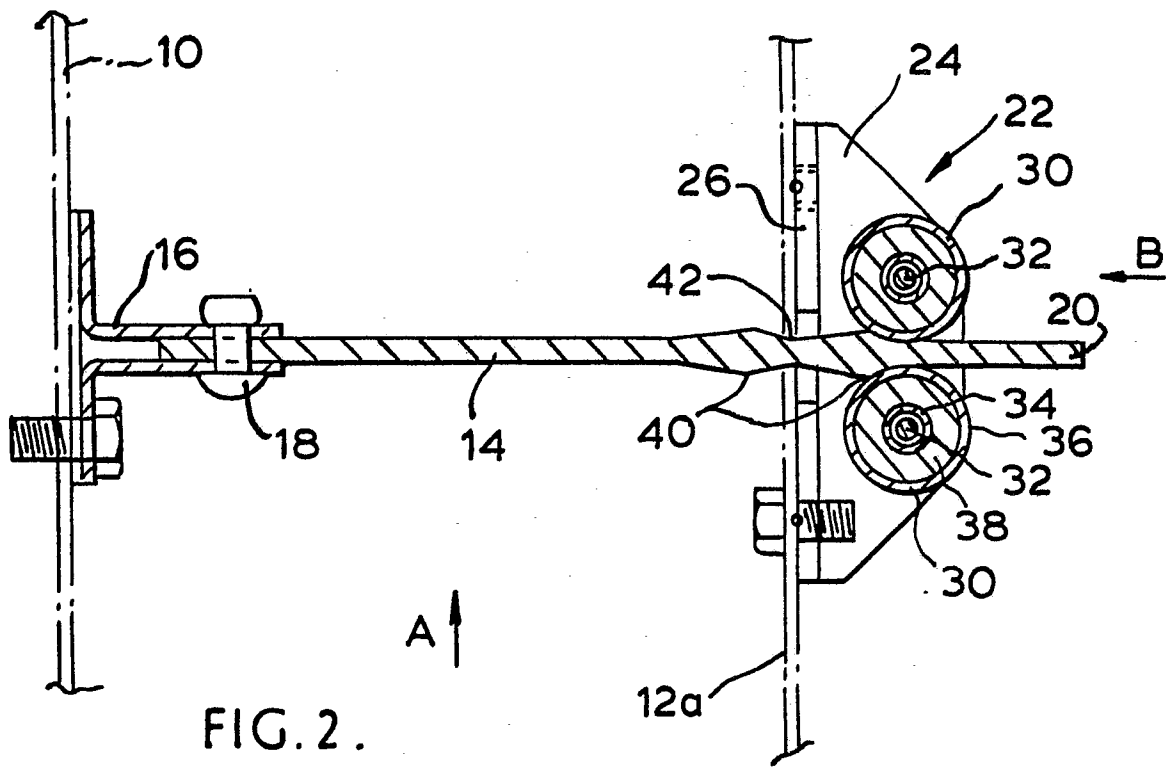


FIG. 2.

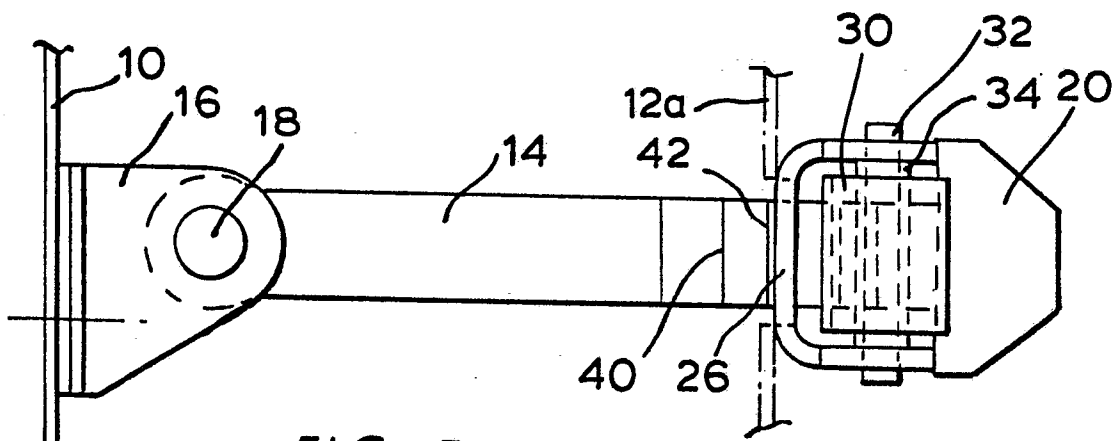


FIG. 3.

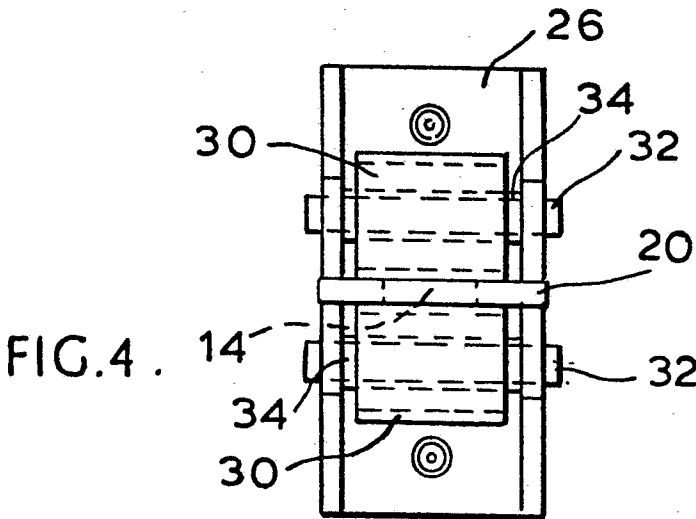


FIG. 4.