(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 179 409**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 85113228.2

(22) Date of filing: 18.10.85

(51) Int. Cl.⁴: A 47 C 4/44
A 47 C 4/20

(30) Priority: 25.10.84 IT 2361484 U

(43) Date of publication of application:
30.04.86 Bulletin 86/18

(84) Designated Contracting States:
AT BE CH DE FR GB LI NL SE

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(54) Foldable chair structure incorporating a safety device.

(57) The foldable chair structure comprises a seat frame (1) to the sides whereof front (2) and rear (4) legs are pivotally connected. The extensions (7) of the front legs (2) are journalled to armrests (8), in turn pivoted on a middle portion of the backrest frame (10). The backrest frame (10) is pivotally connected to the extensions (11) of the rear legs. An oscillable plate (30,40) is journalled on a middle portion of the backrest frame (10) and is releasably engageable by contact with the free ends of the rear leg (4) extensions (11) to prevent accidental folding of the chair structure.

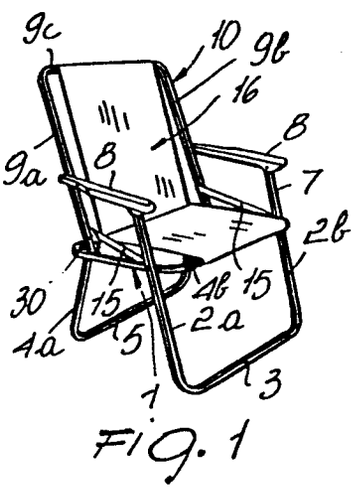

Fig. 1

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FOLDABLE CHAIR STRUCTURE INCORPORATING A SAFETY DEVICE

This invention relates to a foldable chair structure incorporating a safety device.

As is known, currently available on the market are foldable chairs which comprise essentially a seat frame extending in a closed loop, to the sides whereof the chair's front legs and rear legs are pivotally connected. To extensions of the front legs, armrests are pivoted which are, in turn, connected pivotally to a middle portion of the backrest frame, the latter being pivoted on extensions of the rear legs.

Also provided are braces connecting a point of the backrest frame to the pivotal connection area between the seat frame and front legs.

The seat and backrest are defined by a fabric or plastics sheet which is connected with its middle portion to springs associated with the rear portion of the seat frame.

Such prior foldable chairs have the advantage that they can be reduced to a very compact folded size, since the front and rear legs can be folded down, to an interleaved condition, against the seat frame while, by virtue of the above-described linkages, the backrest frame can likewise be brought to overlie the seat frame.

These types of foldable chair have shown to be quite convenient and functional but are liable to accidentally collapse, with obvious potential hazard for their users, if handled improperly, and typically if a force is exerted on a front leg tending to cause the

rear legs to swing in to a folded condition of the chair as the user generally applies his/her full weight to the front portion of the chair and the chair only rests on its front legs.

It is the aim of this invention to obviate the above-mentioned hazardous situation by providing a folding chair structure which incorporates a device effective to prevent the chair from collapsing unintentionally.

Within the above aim, it is a particular object of the invention to provide a foldable chair structure incorporating a safety device for preventing it from accidentally collapsing which is of simplified construction such that it introduces no constructional complications of sort.

Another object of this invention is to provide a foldable chair structure incorporating a safety device , which owing to its peculiar construction, can give full assurance of being reliable and safe to use.

A not least object of the invention is to provide a foldable chair structure incorporating a safety device, which can be readily manufactured from commercially available elements and materials and be highly competitive from a purely economical standpoint.

The above aim, and these and other objects to become apparent hereinafter, are achieved by a foldable chair structure incorporating a safety device, according to the invention, comprising a closed loop

seat frame to the sides whereof there are pivotally connected front and rear legs, extensions of said front legs being pivotally connected to armrests, pivoted at the other ends thereof to a middle portion of a backrest frame, said backrest frame being connected pivotally to extensions of said rear legs, characterized in that it comprises locking means effective to prevent the chair from accidentally collapsing and including at least one oscillable plate journalled to a middle portion of said backrest frame and releasably engageable by contact with the free ends of the rear leg extensions to prevent pivoting to a folded condition.

Further features and advantages of the invention will be apparent from the following detailed description of a foldable chair structure incorporating a safety device, to be read in conjunction with the accompanying illustrative and not limitative drawings, where:

Figure 1 is a perspective, schematic view of a foldable chair structure according to the invention;

Figure 2 is a top plan view of the foldable chair structure, shown in its unfolded in-use condition;

Figure 3 is a side view of the foldable chair structure of Figure 2;

Figure 4 is a fragmentary side elevation view of the foldable chair structure showing in detail the locking means associated therewith, in a locked condition thereof;

Figure 5 is a further detail view similar to the view of Figure 4, illustrating the release phase of the locking means to allow the chair to be folded;

Figure 6 is a perspective detail view from one side of the plate forming the locking means;

Figure 7 is a perspective view of the other side of the plate of Figure 6;

Figure 8 is a side elevation view showing in detail the locking means as mounted to the inward side of the chair connecting brace;

Figure 9 is a top plan view of the plate of Figure 8; and

Figure 10 is a perspective view of the plate of Figure 8.

With reference to the drawing figures, a foldable chair structure incorporating a safety device, according to the invention, comprises a seat frame, generally designated with the reference numeral 1, which is preferably a closed loop design of substantially quadrangular configuration, including two substantially parallel lateral portions 1a, 1b forwardly interconnected by a front piece 1c, and rearwardly interconnected by a rear portion 1d lying substantially parallel thereto.

At the front of the lateral portions 1a, 1b of the seat, outwardly of the frame, there are pivoted the front legs 2a, 2b which, as is usual, comprise a tubular member folded to a substantially "U"-like configuration and defining a floor resting zone at an interconnection section 3, extending between said front legs 2a, 2b.

Inwardly of the seat frame 1, rearwardly at the lateral portions 1a, 1b thereof there are pivoted the rear legs 4a, 4b also formed from a bent tubular

member defining a substantially "U"-like configuration, which further defines a floor resting zone at its interconnecting section 5 extending between said rear legs 4a, 4b.

The upward extensions 7 of the front legs 2 are journalled at their uppermost ends to the anterior portions of substantially horizontal armrests 8 which are pivoted, at their rear ends, to the upright members 9a, 9b of the backrest frame, generally indicated at 10, which defines an inverted "U"-like member including a substantially horizontal portion 9c extending between the upper ends of the upright members 9.

At their bottom ends, the uprights 9 are journalled proximately to the upper extremities of the extensions 11 of the rear legs 4.

Also provided is a connecting brace 15, formed preferably from plastics or other such suitable material, which is connected at its forward portion 15a between the point of pivotal connection of the front legs 2 to the seat frame 1 and at its rear portion 15b to a middle portion of the uprights 9 at the area thereof extending between the pivotal connection of the armrests 8 to the extensions 11 of the rear legs 9a, 9b.

Obviously, all of the cited connections between elements of the chair's frame may be achieved by the utilization of any suitable pivotal connection means such as rivets, nuts and bolts, upturned pins etc.

The chair is then completed by partially covering the chair frame with a sheet, generally indicated at 16, which extends from the front piece 1c of the seat frame 1 to the horizontal portion 9c extending between the

uprights 9 to define the seat 18 and backrest 19 and is connected, at the area joining the seat to the backrest, to springs 20 connected to the rear portion 1d of the seat frame 1.

The peculiar aspect of the invention is that locking means are provided to prevent the chair from accidentally collapsing; the locking means comprise an oscillable plate, indicated at 30, which is expediently journalled at a first end portion 30a thereof including a through hole 30b to the upright 9 at the area of pivotal connection to the brace 15 (Figure 5).

That plate 30 has at a second end portion 30c thereof, a seat 31 which is adapted to engage with the free ends of the extension 11 of the rear legs, so as to form an abutment effective to prevent the chair from being folded down.

Thus, in order to be able to fold the chair, the plate 30 must be removed from its position of engagement and specifically the extension 11 must be released from its engagement with the abutment seat 31, before the rear leg can be pivoted in order to fold the chair.

To this end, it will be sufficient to turn the chair upside down, thereupon the plate 30 will swing by gravity away from the extension 11 thereby uncoupling the engagement between the end of the extension 11 and the seat 31 and thus allowing the chair to be folded down.

To permit accurate positioning of the plate 30, means are advantageously provided which are adapted to delimit the upward pivotal movement of the plate 30

comprising a side lug 35 which is expediently formed integrally with the plate 30, protruding laterally therefrom such that it engages in abutment engagement relationship with the brace 15, to prevent the plate from pivotally moving downwardly below the same, a projection 36 is also expediently provided which is also advantageously formed integral with the plate 30, protruding laterally therefrom at a side opposite to said side lug 35, thereby the projection 36 engages by contact with the uprights 9.

Thus, in this example, wherein the side lug 35 and projection 36 project from opposite sides of the plate 30, the plate 30 would be placed between the upright 9 and the brace 15.

However, as shown in Figure 8, a plate 40 could be alternatively provided inwardly of the brace 15.

In this case, the locking means preventing the plate from turning accidentally upward would comprise a bottom extension or protuberance 41 which is adapted to engage with the bottom portion of the brace 15, and the means preventing the plate 40 from turning downward would comprise a top extension or protuberance 42, expediently positioned proximately to the pivotal connection area or through hole 40a and being adapted for abutment engagement with the top portion of the brace 15, the bottom protuberance 41 and the top protuberance 42 both projecting laterally from the same side of the plate 40.

Furthermore, the plate 40 may be provided with a plurality of detents such as a first detent seat 45 and

a second detent seat 46, (Figure 10), which are selectively engageable with the free ends of the extensions to provide different angular inclinations of the chair back 19 with respect to the seat 18 with the chair in its open condition.

The folding chair of this invention is designed such that, when in the open condition, the plate, 30 or 40, will be caused by gravity to abut with its free end against the free end of the extension 11, thereby any force acting in the chair-folding direction would be resisted, since the rear legs are prevented from pivoting due to the engagement of the seat 31 or abutment detent 45,46 with the cited free end of the extension 11, (Figure 4).

To fold the chair down, it will be sufficient to turn the chair upside down (Figure 5), whereupon the plate will swing away from the end of the rear leg extension 11 by gravity, thus permitting the rear legs free to oscillate to the position assumed in the folded condition of the chair.

It should be further added that those means which delimit the free pivotal movement of the plate in an upward or downward direction have the function of preventing the plate from assuming an improper setting such that it cannot freely swing to its automatically locked position on unfolding the chair.

It may be appreciated from the foregoing description that the invention achieves its objects, and in particular it should be stressed that through very simple means, such as those including the plate

journalled to the upright at the area of pivotal connection of the connecting brace, a high degree of safety is imparted to the chair, which can no longer accidentally fold down.

Another important aspect is that the plate mounting involves no special processing, since the plate is installed at a pivotal point of connection which is already conventionally provided on chairs of this type.

In practicing the invention, any materials, contingent shapes and dimensions may be used, so long as compatible with the specific application.

CLAIMS

1. A foldable chair structure incorporating a safety device, comprising a close loop design seat frame (1) to the sides whereof there are pivotally connected front (2) and rear (4) legs, extensions (7) of said front legs (2) being connected pivotally to armrests (8), pivoted at the other ends thereof to a middle portion of a backrest frame (10), said backrest frame (10) being connected pivotally to the extensions (11) of said rear legs (4), characterized in that it comprises locking means effective to prevent the chair from accidentally collapsing including at least one oscillable plate (30,40) journalled to a middle portion of said backrest frame (10) and being releasably engageable with free ends of the rear leg (4) extensions (11) to prevent pivoting to a folded condition.

2. A foldable chair structure according to Claim 1, characterized in that said plate (30,40) is journalled at the area of pivotal connection of the connecting brace (15) to the backrest frame (10) journalled, at the other end thereof, to the pivotal point between the front legs (2) and seat frame (1).

3. A foldable chair structure according to the preceding claims, characterized in that said plate (30,40) has, at the free end thereof, at least one detent seat (31,45,46) wherein the free end of said rear leg (4) extension (11) can be engaged.

4. A foldable chair structure according to one or more of the preceding claims, characterized in that

said plate (30) is positioned between said connecting brace (15) and the upright (9) of the backrest frame (10).

5. A foldable chair structure according to one or more of the preceding claims, characterized in that said plate (30) has means for delimiting the upward swing comprising a side lug (35) engageable with the bottom portion of said frame (1), and means for restricting the downward swing comprising a peg (36) projecting sideways from said plate (30) and being engageable with said upright (9).

6. A foldable chair structure according to one or more of the preceding claims, characterized in that said plate (40) is connected to the inward side of said connecting brace (15).

7. A foldable chair structure according to one or more of the preceding claims, characterized in that said plate (40) has first (45) and second (46) detent seats wherein said extensions (11) of the rear legs (4) are engageable selectively.

8. A foldable chair structure according to one or more of the preceding claims, characterized in that it comprises, on said plate (40), means for delimiting the upward swing comprising a bottom extension (41) adapted to engage by contact with the bottom portion of said connecting brace (15), and means for restricting the downward swing comprising a top extension (42) engageable by contact with the top portion of said connecting brace (15).

9. A foldable chair structure according to one

or more of the preceding claims, characterized in that said plate (30,40) is disengageable from said free ends of the rear leg (4) extensions (11) by upsetting said chair, on said plate swinging by gravity.

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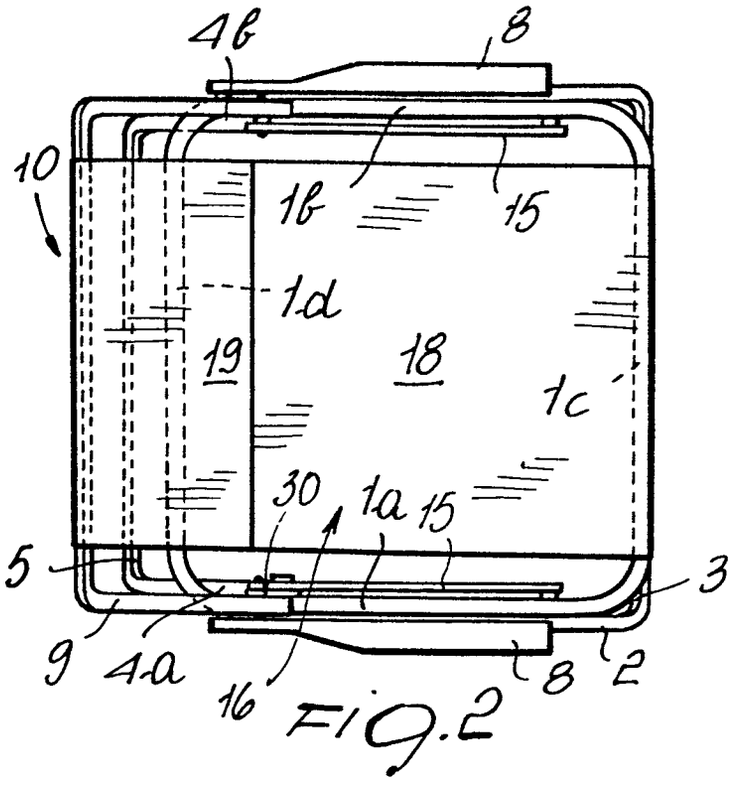

FIG. 2

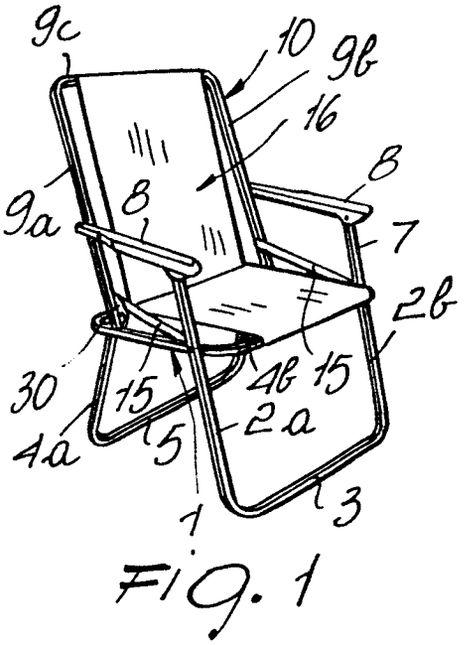

FIG. 1

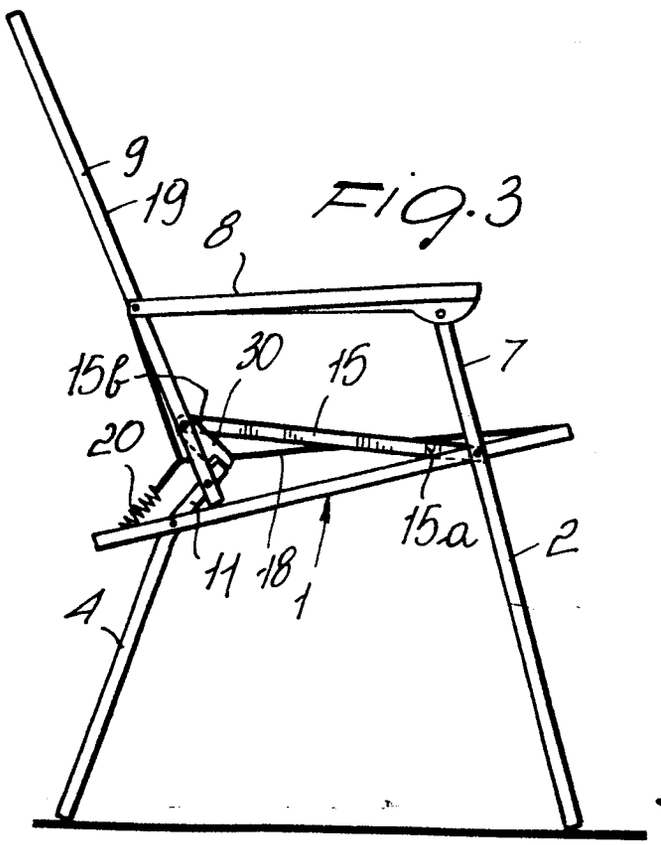

FIG. 3

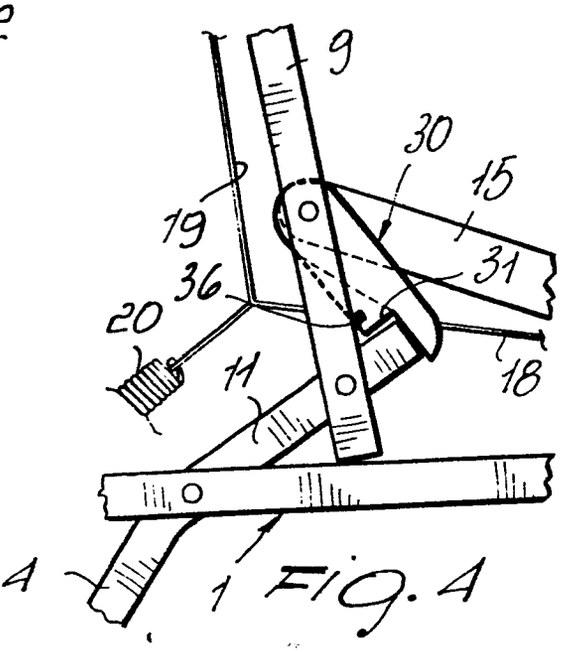

FIG. 4

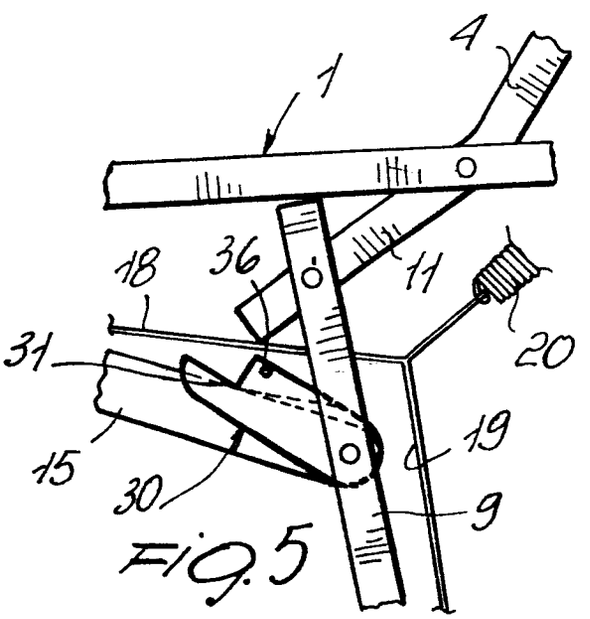

FIG. 5

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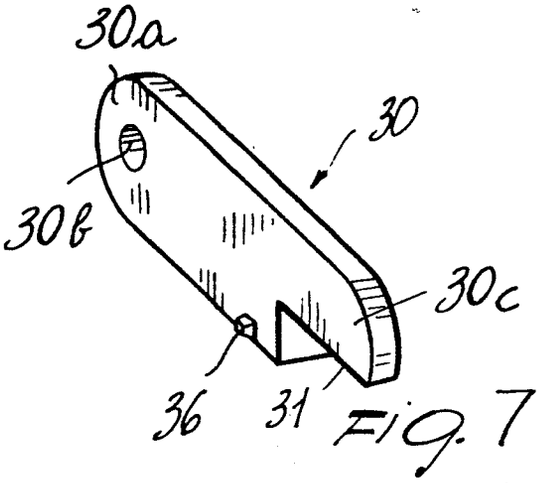

Fig. 7

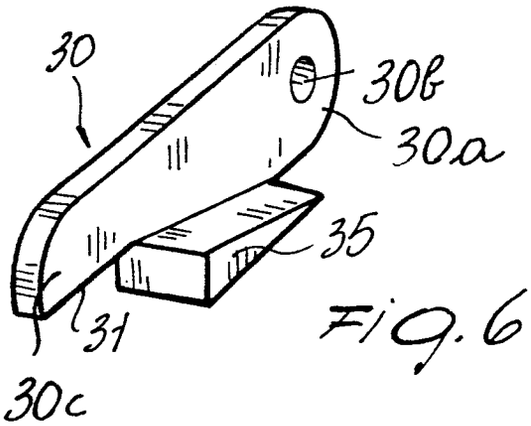

Fig. 6

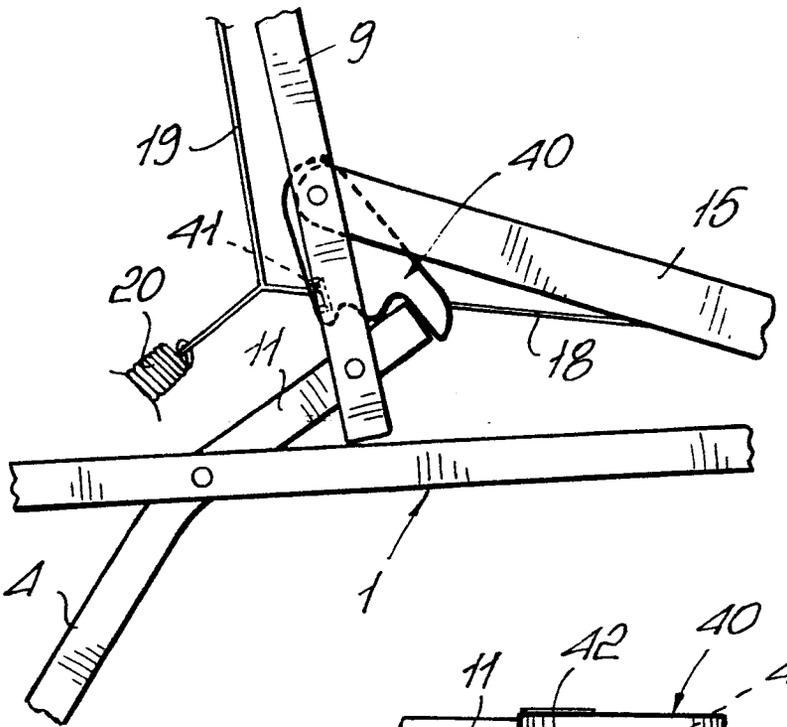

Fig. 8

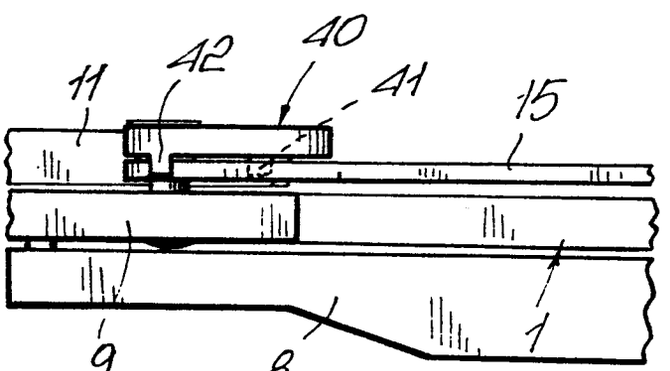

Fig. 9

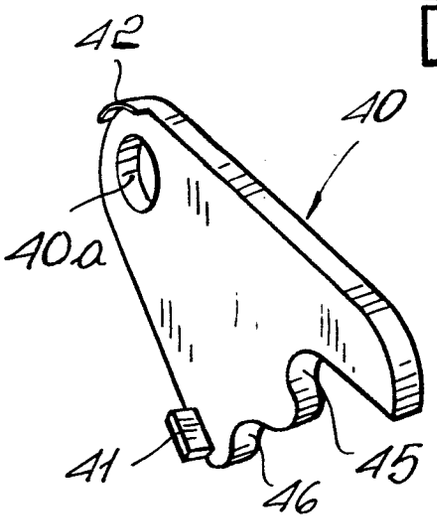

Fig. 10