

⑫ **EUROPEAN PATENT APPLICATION**

⑰ Application number: **85830299.5**

⑥ Int. Cl.: **B 25 C 5/15**

⑱ Date of filing: **06.12.85**

⑳ Priority: **25.01.85 IT 1924785**

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㉑ Date of publication of application: **30.07.86**
Bulletin 86/31

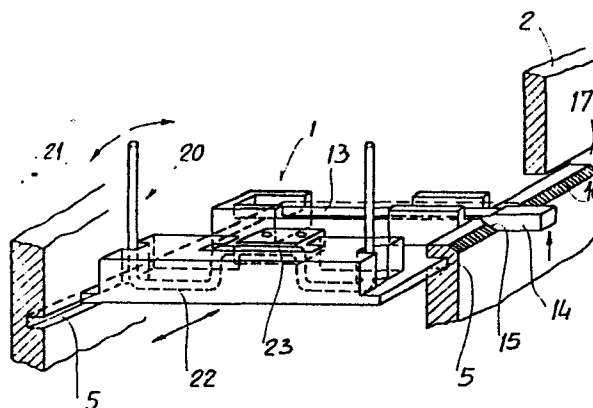
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㉒ Designated Contracting States: **AT BE CH DE FR GB LI NL SE**

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⑤④ **A trigger mechanism for an electromechanical actuator for operating a desk stapler.**

⑤⑦ An electromechanical actuator device for operating a desk stapler, which has a trigger mechanism comprising a movable assembly (1) selectively positionable in the casing (2) of the electromechanical actuator device in the region of the zone of application of the metal staples. The said movable assembly (1) has a pivotable striker (20) projecting into the slot (47) for introduction of sheets so as to be contacted thereby and pivoted upon the introduction of sheets to be stapled, such pivoting movement bringing a part (23) of the striker (20) into operating contact with the operating arms of a microswitch (40) so as to initiate operation of the electromechanical actuator device.



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"A Trigger Mechanism for an Electromechanical Actuator
for Operating a Desk Stapler"

The present invention relates generally to an elect-
5 romechanical actuator for operating a desk stapler, and
particularly to such a device having an improved trig-
ger mechanism. In an earlier Italian Patent applica-
tion by the same applicant (Italian Patent Application
No. 22054 A/83 filed 3 July, 1983) the disclosure
10 of which is incorporated herein by reference, there
is illustrated an electromechanical actuator device
which allows automatic operation of a desk stapler
of standard type to be obtained. This electromech-
anical actuator device comprises an outer casing in
15 which a conventional manually operated desk stapler
can be housed, and which has a triggering mechanism
for initiating operation of a presser unit which
exerts a compression on the movable part of the desk
stapler to effect application of the staples. The
20 trigger mechanism of this known electromechanical
actuator device includes a lever which, upon intro-
duction into the machine of the sheets to be stapled,
is turned by contact with the sheets and causes the
actuation of the presser unit which then operates
25 the stapler.

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Although this arrangement has been demonstrated to work it has the disadvantage that the sensitivity of the trigger mechanism is not great, and a more sensitive arrangement would be advantageous.

5

The present invention seeks therefore to provide an electromechanical actuator for a desk stapler, which can be triggered with a greater sensitivity than the hitherto known device, and which is therefore
10 capable of providing a secure operation and offers the possibility of always obtaining a precise positioning of the staple. A particular feature of the present invention is that such positioning can be made adjustable within a wide range, in dependence
15 on any particular requirements.

The present invention also seeks to provide a triggering mechanism for an electromechanical actuator for a stapling machine, which can readily be fitted
20 to an actuator of the type described in our earlier Italian Patent application referred to above, thereby moreover, rendering more precise and secure the operation of the known devices as well.

25 According to one aspect of the present invention, there is provided, a trigger mechanism for an electromechanical actuator device for operating a desk stapler, characterised by the fact that it comprises a movable assembly selectively positionable in the
30 casing of an electromechanical actuator device

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the movable assembly having a pivotable striker projecting into the path of sheets introduced into the stapler to be stapled thereby, such that upon introduction of the sheets to be stapled the
5 striker is caused to pivot into contact with the operating member of a microswitch for control of the said electromechanical actuator.

A particular feature of the present invention is
10 that it provides a triggering mechanism which, as well as having significantly improved operating characteristics, is structurally simple and is rapid, easy and economical to produce. Moreover, the
15 trigger mechanism of the invention, as well as being easily obtainable starting from commonly commercially available materials, is highly competitive from a purely economic point of view.

According to another aspect, the present invention
20 provides an electromechanical actuator device for a desk stapler of the type comprising a casing having sides in which are respective slots for allowing the introduction of sheets of paper to be stapled by a
25 stapler housed in the casing with its operating head aligned with the slots, characterised in that the actuator has a trigger mechanism including a base adjustable longitudinally of the slots and carrying a pivotable striker which projects into the path of the sheets to be stapled so as to be contacted

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thereby as they are introduced, and a microswitch carried by the said base in a position such as to be contacted by the striker as it turns, the microswitch being electrically connected to the actuator so as
5 to initiate operation thereof when switched by contact with the striker.

One embodiment of the invention will now be more particularly described, by way of example, with
10 reference to the accompanying drawings, constituting an embodiment of the invention;

Figure 1 is a partly exploded perspective view of a trigger mechanism,

Figure 2 is a plan view from above, of the
15 trigger mechanism shown in Figure 1,

Figure 3 is a side view of the trigger mechanism shown in Figure 1,

Figure 4 is a section taken on the line
IV-IV of Figure 2,

20 Figure 5 is a side view of an electromechanical stapler actuator having the trigger mechanism of Figure 1 fitted thereto;

Figure 6 is a plan view of the base of a movable element forming part of the trigger mechanism
25 of Figure 1;

Figure 7 is a section taken on the line VII-VII of Figure 6;

Figure 8 is a section taken on the line VIII-VIII of Figure 6;

30 Figure 9 is a plan view of a retaining element for a pivotable striker forming part of the trigger mechanism of Figure 1;

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Figure 10 is a section taken on the line X-X of Figure 9;

Figure 11 is a section taken on the line XI-XI of Figure 9; and

5 Figure 12 is a side view of the retaining element shown in Figure 9.

Referring now to the drawings, the triggering mechanism shown is adapted for use in an electro-
10 mechanical actuator for a desk stapler, and comprises a movable trigger assembly which is indicated generally with the reference numeral 1 and which can be fitted so as to be slidable as will be more clearly
15 seen hereinbelow, between the sides 2 of the outer casing of an electromechanical actuator device such as that forming the subject of the Italian Patent Application previously referred to. The movable
20 trigger assembly 1 includes a base 3, illustrated in Figures from 6 to 8, which has lateral edges 4 which slidably engage in guide grooves 5 provided on the inner surfaces of the sides 2.

The base 3 has, adjacent its front edge, a transverse recess 6 and is provided with upstanding pins 7 for
25 coupling of a retaining element 10 which will be described hereinbelow. Behind the recess 6, away from the front edge of the base 3 there is provided a support block 11 flanked by a guide block 12 having a channel in its upper face. On the support block
30 11 there is fixed one end of a resilient tongue 13 the middle portion of which lies in the channel in the guide block 12 and the free end of which

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projects laterally through a slot 17 in one of the sides 2. The free end of the tongue 13 has an actuating head 14 provided with an inclined notched section 15 which engages with a correspondingly
5 inclined notched rack 16 formed on one edge of the slot 17 in the side 2 of the casing in the region where introduction of the sheet takes place.

The resilient tongue 13 elastically maintains the
10 notched section 15 pressed against the rack 16 thus consequently holding the movable assembly in position and resisting displacement parallel to the rack 16. By raising the head 14, overcoming the resilient resistance of the tongue 13, the notched section 15
15 is separated from the rack 16 thus allowing movement of the movable assembly with respect to the side of the casing 2, to allow it to be set in a desired position.

20 The movable assembly 1 supports a pivotable striker generally indicated with the reference numeral 20, which has a U-shape conformation with two parallel arms 21 disposed vertically and projecting perpendicularly from the plane defined by the base
25 3, and a connecting section 22 which is turnably housed in the recess 6. The central portion 23 of the connecting section 22 is offset from the remainder thereof, in the plane defined by the two arms and towards the free ends of the arms 21. The purpose
30 of this will be described hereinbelow.

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The striker element 20 is held on the base 3 by means of a retaining element 10 which has an elongate conformation with holes 31 for engagement with the pins 7 and, in its central part has an undercut recess 32 for receiving the central offset portion of the connecting section 22 of the U-shape striker 20. A microswitch 40 is fitted into the undercut recess 32 of the retaining element 10 and carried on the base 3 by means of positioning pins 41 extending from the base 3. The microswitch 40 has an actuating contact 42 facing towards the central portion 23 in such a way that upon pivoting of the striker 20 when contacted by sheets of paper introduced into the device electromechanical actuation of the desk stapler is triggered.

With the device described above the user can easily displace the movable assembly along the slot 17 to any desired position to determine how far the papers are introduced before operation of the stapler is triggered, thereby determining where on the sheet the staple is applied whereby to set a selected distance between the free edge of the sheet and the point of application of the staples. Once this position has been selected by lifting the head 14 from the rack 16 and sliding it (and thus the whole of the movable assembly 1) along the slot 17 it is possible to determine how far to insert the sheets into the slot 47. The sheets to be stapled, which are indicated 50 in Figure 5, when they strike the arms 21 of the striker 20, cause a horizontal inward

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pivoting of these arms, that is to day in a clock-wise sense as seen in Figure 5, so that the central offset part 23 of the connecting portion 22 of the U-shape striker 20, upon turning, presses on the
5 contact 42 of the microswitch 40, which initiates operation of the electromechanical actuator device.

The particular arrangement used makes the trigger mechanism extremely sensitive so that only a very low
10 pressure is needed to cause pivoting of the striker 20 thus obtaining a very precise operation of the electromechanical actuator device which effects the application of the staple, merely by touching the edge of the sheets to be stapled against
15 the striker 20.

Moreover, the fact that all the component elements have been fitted onto a base, the position of which can be adjusted with respect to the casing of the
20 electromechanical device, gives the possibility of selectively positioning the device itself so as to obtain precise adjustment of the point of application of the staples to the sheets.

25 From what has been described hereinabove it will be seen how the invention achieves the objects proposed. In particular, it is desired to underline the fact that the trigger mechanism described above, whilst being structurally simple and of simplified
30 assembly, is able to offer significant functional

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advantages which made the electromechanical actuator device for desk staplers more practical and effective. Another important advantage lies in the fact that the striker element can be simply constituted by
5 a bent metal wire which is mounted pivotably on the base but with only a limited range of turning movement due to the housing of the offset portion 23 of its connecting portion 22 in the undercut recess 32 formed in the striker retaining element.

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Claims:

1. A trigger mechanism for an electro-
mechanical actuator device for operating a desk
5 stapler, characterised by the fact that it comprises
a movable assembly (1) selectively positionable in
the casing (2) of an electromechanical actuator
device, the movable assembly (1) having a pivotable
striker (20) projecting into the path of sheets
10 introduced into the stapler to be stapled thereby,
such that upon introduction of the sheets to be
stapled the striker (20) is caused to pivot into
contact with the operating member of a microswitch
(40) for control of the said electromechanical
15 actuator.

2. A trigger mechanism according to Claim 1,
characterised by the fact that the said movable ass-
embly (1) has a base (3) the lateral edges of which
20 can be slidably housed in guide grooves (5) defined
on the inner faces of the sides (2) of the casing.

3. A trigger mechanism according to Claim 1
or Claim 2, characterised by the fact that the said
25 striker (20) is retained on the base (3) by means
of a retaining element (10) connectable to the base
(3) and defining therewith the pivotable connection
of the striker (20) to the base (3).

30 4. A trigger mechanism according to Claim 3,
characterised by the fact that the striker (20)
is constituted by a U-shape metal element having

arms (21) extending generally perpendicularly of the base (3), and a connection section (22) pivotally housed in a recess (6) defined by the base (3), the said retaining element (10) which connects the
5 striker (20) to the base (3) being provided in its central portion with a recess (32) for housing an offset central part (23) of the said connection section (22).

10 5. A trigger mechanism according to Claim 4, characterised by the fact that the said microswitch (40) is housed in the recess (32) in the retaining element (10), and the contact thereof faces the central offset part (23) of the striker (20).

15 6. An electromechanical actuator device for a desk stapler of the type comprising a casing having sides (2) in which are respective slots (47) for allowing the introduction of sheets of paper to be
20 stapled by a stapler housed in the casing with its operating head aligned with the slots (47), characterised in that the actuator has a trigger mechanism including a base (3) adjustable longitudinally of the slots (47) and carrying a pivotable striker
25 (20) which projects into the path of the sheets to be stapled so as to be contacted thereby as they are introduced, and a microswitch (40) carried by the said base (3) in a position such as to be contacted by the striker (20) as it turns, the microswitch (40)
30 being electrically connected to the actuator so as to initiate operation thereof when switched by contact with the striker (20).

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7. An electromechanical actuator device according to Claim 6, characterised by the fact that the base (3) also carries a support block (11) and a guide block (12) which together carry a resilient tongue (13) which projects through a slot (17) in the side (2) of the actuator casing.

8. An electromechanical actuator device according to Claim 6, characterised by the fact that the free end of the resilient tongue (13) has a head (14) with an inclined notched surface (15) which is held by the resilience of the tongue (13) in contact with a correspondingly notched rack defined on the edge of the slot (17) to provide a cooperating detent mechanism determining the position of the movable assembly (1) along the slot (17).

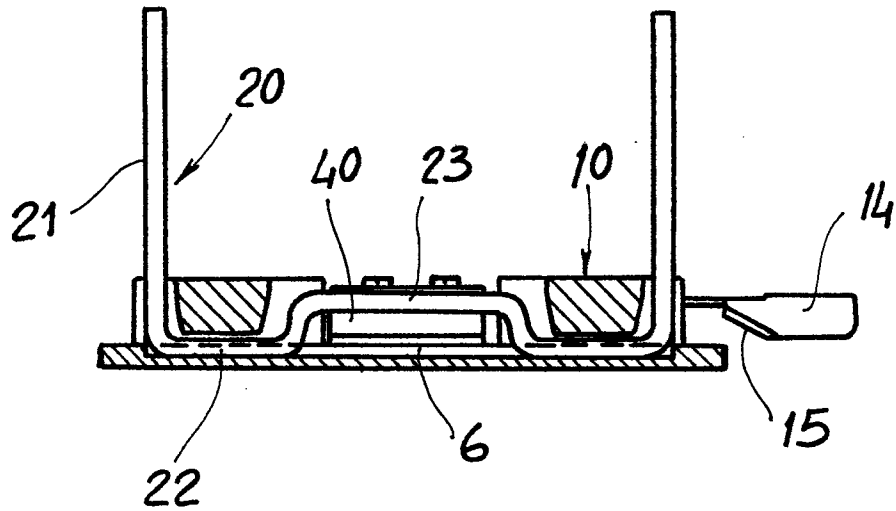


Fig. 4

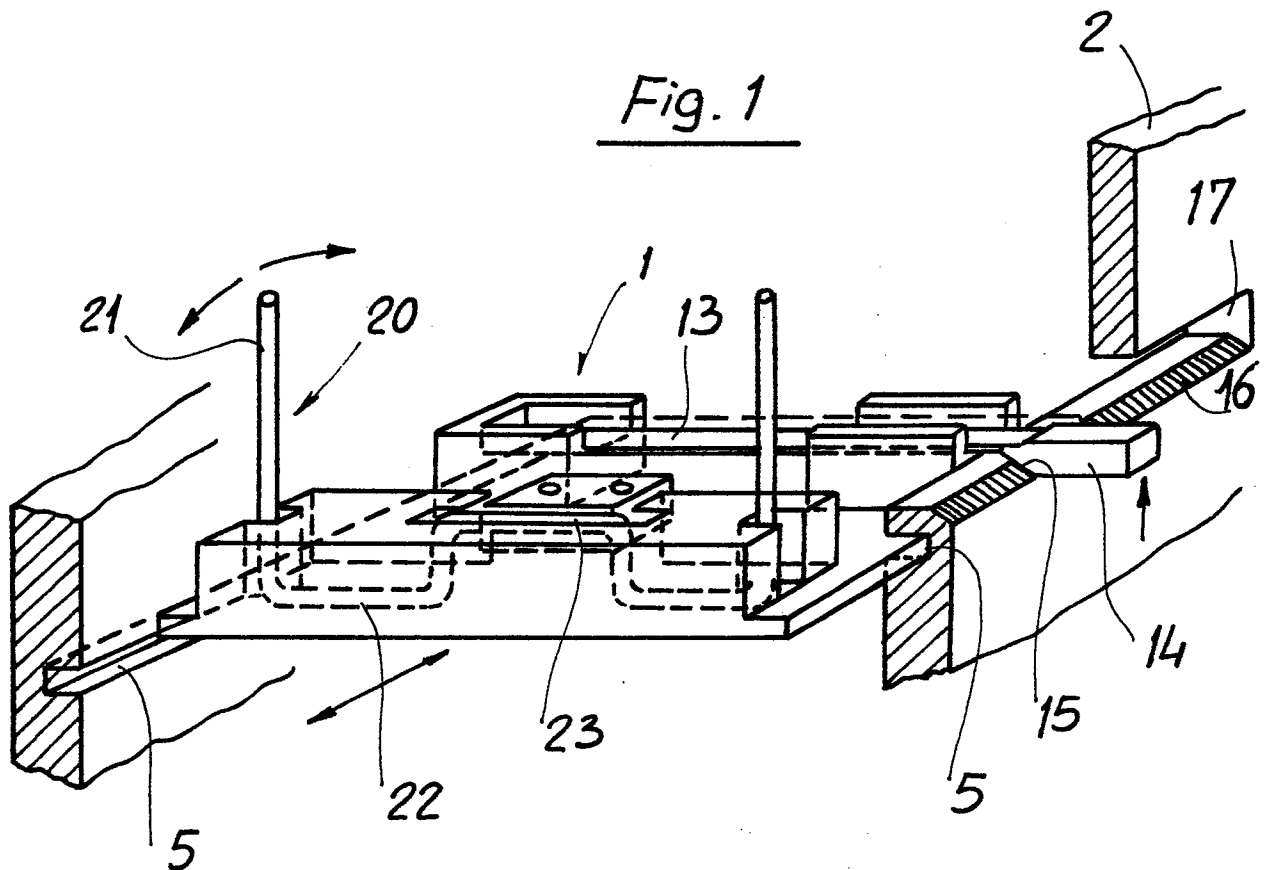


Fig. 1

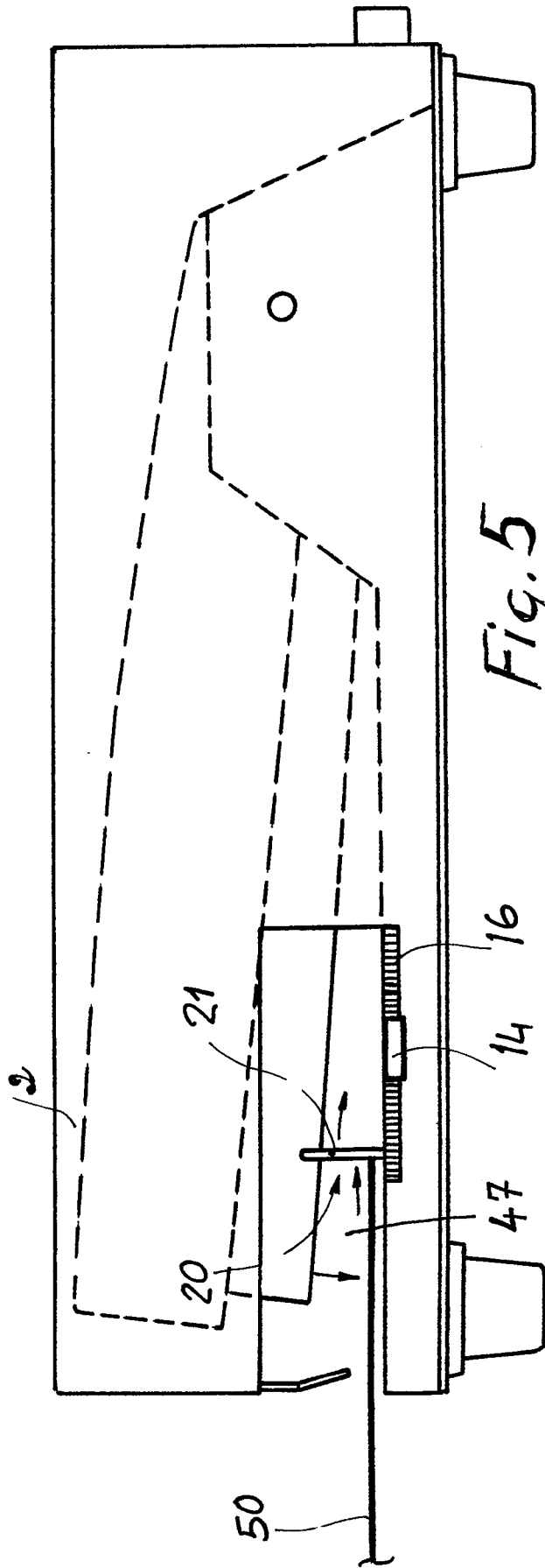


Fig. 5

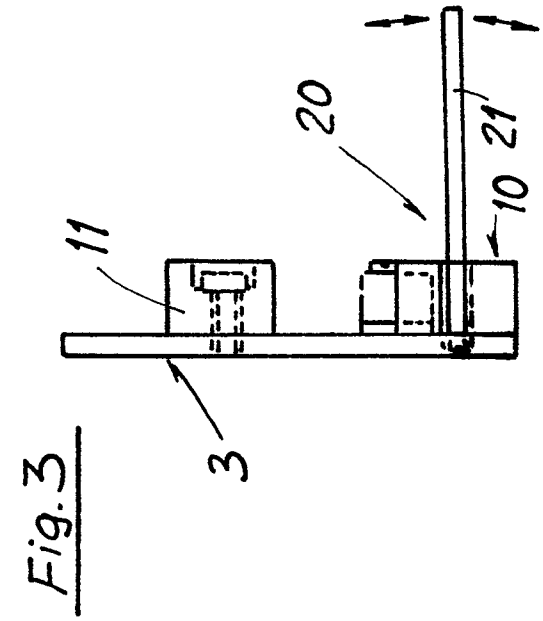


Fig. 3

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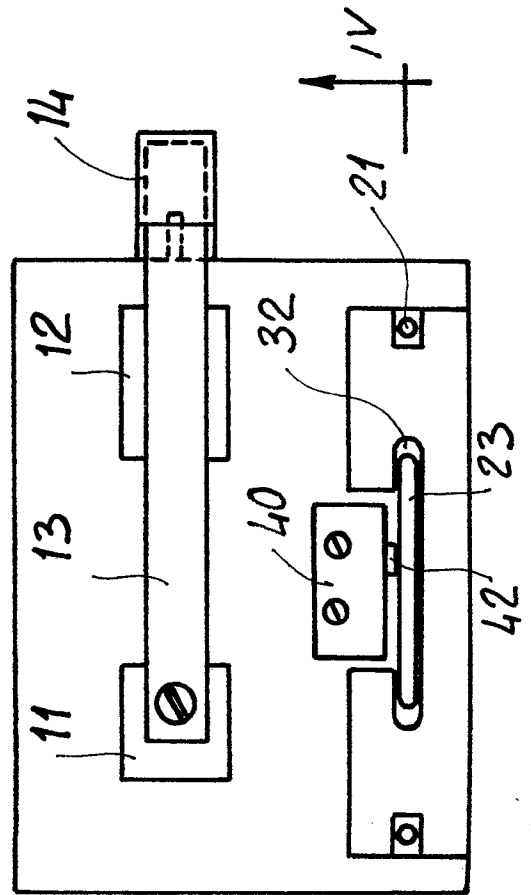


Fig. 2

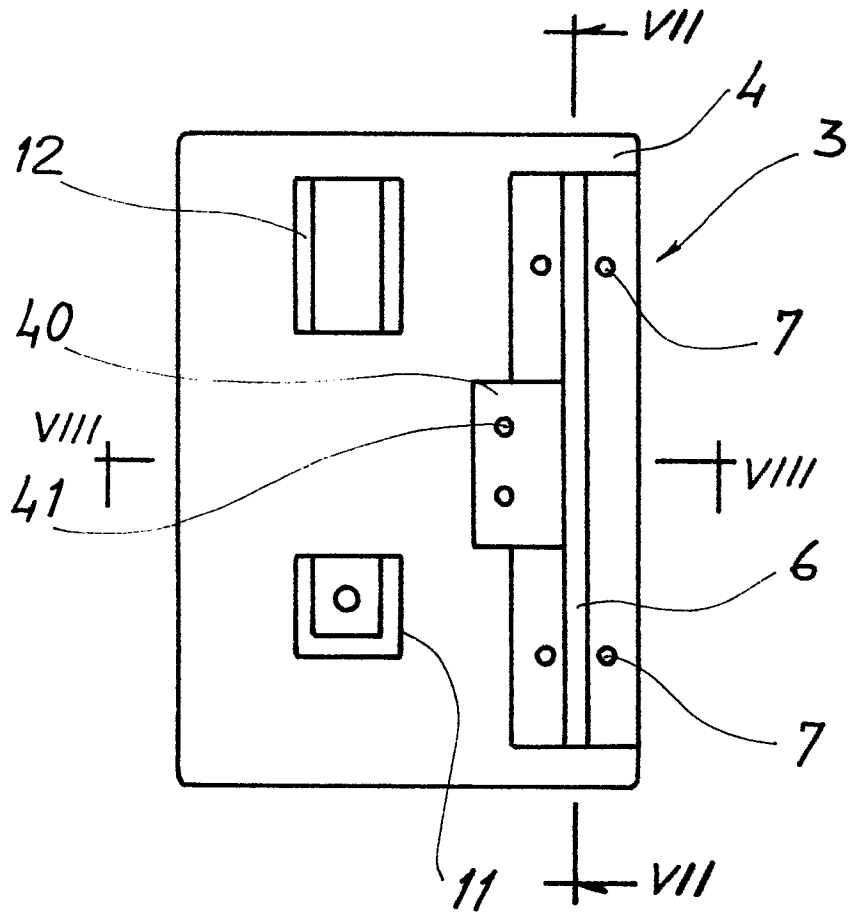


Fig. 6

Fig. 8

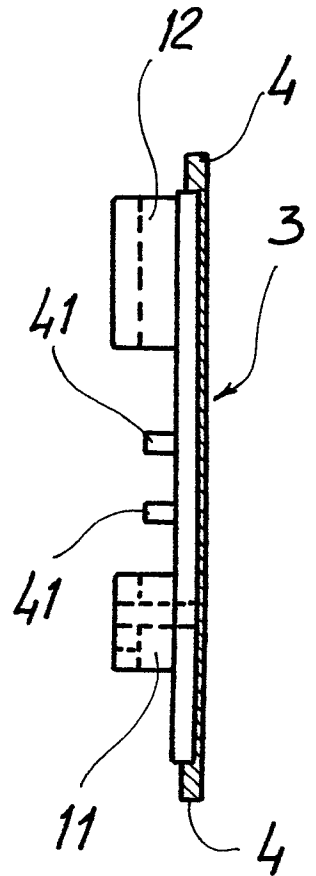
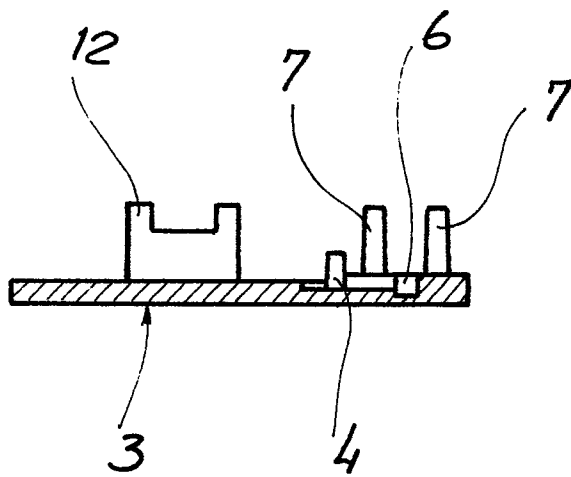


Fig. 7

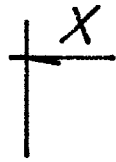


Fig. 9

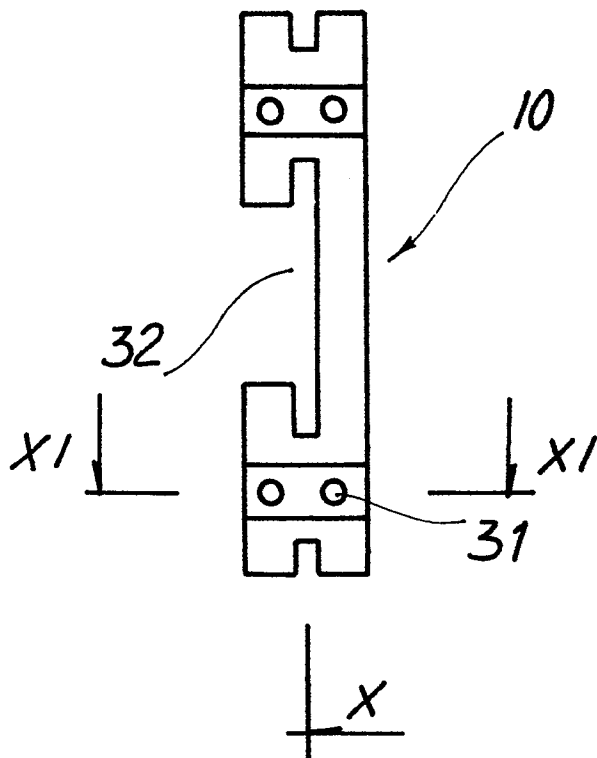


Fig. 10

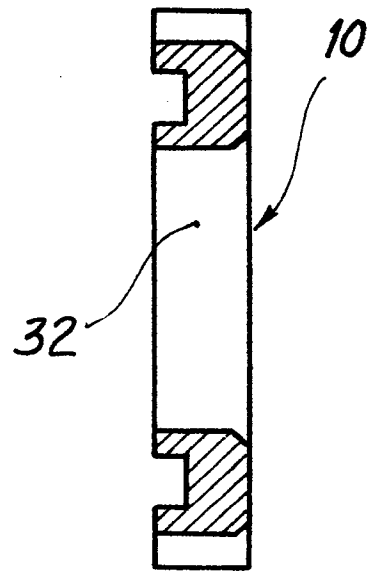


Fig. 11

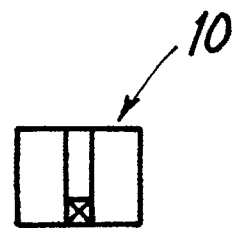
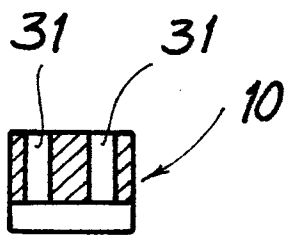


Fig. 12