



(72) CHOISSET, BRUNO, FR

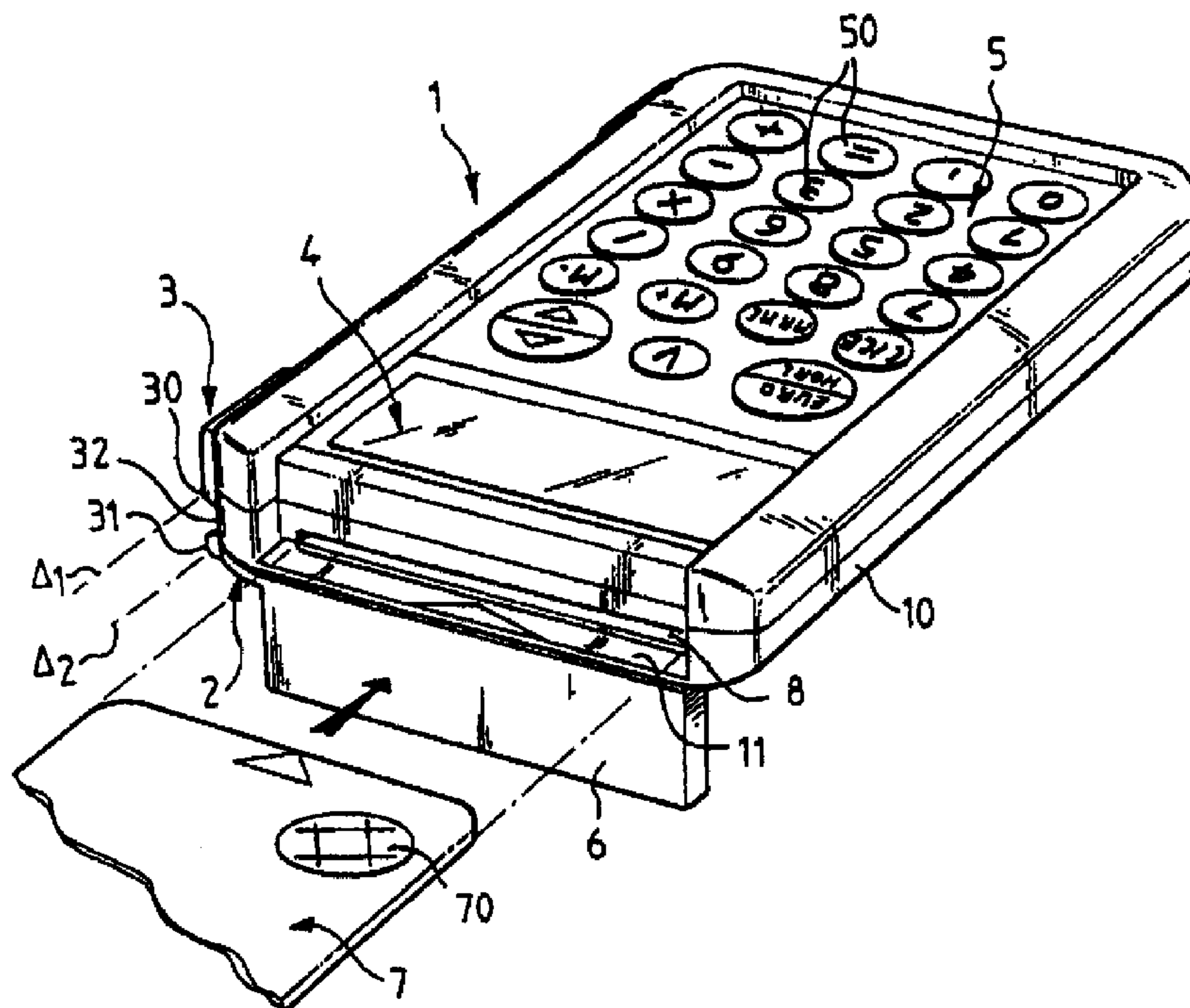
(71) BULL CP8, FR

(51) Int.Cl.⁶ G06K 7/00

(30) 1997/12/30 (97/16697) FR

(54) **DISPOSITIF LECTEUR DE CARTE, NOTAMMENT DE CARTE
A PUCE**

(54) **CARD, IN PARTICULAR CHIP CARD, READING DEVICE**



(57) L'invention concerne un dispositif lecteur (1) de carte (7) comprenant un boîtier (10) muni d'un clavier (5), d'un afficheur (4), d'une fente d'introduction (8) de la carte (7) à l'intérieur du boîtier (10) et d'un capot (2) permettant la protection du clavier (5) et de l'afficheur (4), lorsqu'il est fermé. Il est prévu un rabat (6) solidaire du capot (2). Le capot (2) est fixé au boîtier (10) par un organe (3) lui permettant de pivoter et d'être ramené en dessous de ce boîtier (10). Le rabat (6) recouvre la fente d'introduction (8) lorsque le capot (2) est fermé, et sert de piétement d'appui pour incliner le boîtier (10) lorsque le capot (2) est ouvert.

(57) The invention concerns a card (7) reading device (1) comprising a housing (10) equipped with a keyboard (5), a display unit (4), a slot for inserting (8) the card (7) inside the housing (10) and a cover (2) protecting the keyboard and the display unit (4), when it is closed. A flap (6) is provided, integral with the cover (2) and fixed to the housing (10) by an element (3) enabling it to pivot and be brought underneath said housing (10). The flap (6) covers the insertion slot (8) when the cover (2) is closed, and serves as support base to incline the housing (10) when the cover (2) is open.

ABSTRACT

The invention relates to a card (7) reading device (1) comprising a housing (10) equipped with a keyboard (5), a display unit (4), a slot for inserting (8) the card (7) into the housing (10) and a cover (2) protecting the keyboard (5) and the display unit (4), when it is closed. A flap (6) integral with the cover (2) is provided. The cover (2) is attached to the housing (10) by an element (3) that allows it to pivot and be brought underneath this housing (10). The flap (6) covers the insertion slot (8) when the cover (2) is closed, and serves as a support base to incline the housing (10) when the cover (2) is open.

Fig. 3

1 CARD, IN PARTICULAR CHIP CARD, READING DEVICE
2

3 The present invention relates to a card reading device,
4 particularly a chip card reader.

5 Within the scope of the invention, the term "card" should be
6 understood in its most general sense: magnetic stripe card,
7 "smart" card, "chip" card, etc. It should also be understood that
8 the term "card reader" is generic: it relates to any device that
9 can read and/or write onto cards of the aforementioned types.

10 Likewise, the applications of these cards are quite diverse:
11 banking or similar applications, electronic purses, security
12 badges, etc. In France, in particular, it is customary to provide
13 all those eligible for social security with a short- or
14 intermediate-term "chip" card storing a certain amount of
15 information of a medical and/or administrative nature.

16 For about twenty years or so, these various types of cards,
17 particularly the cards equipped with an "electronic chip," i.e.,
18 with a controller or microprocessor associated with storage
19 circuits, have been widely used, and they play an increasingly
20 large part in the daily lives of individuals.

21 International standards govern the various parameters
22 associated with the cards: dimensions, location of the magnetic
23 stripe, of the "chip" and of the input-output interfaces
24 (connections). Meanwhile, the computing power of the electronic
25 circuits as well as the quantity of information stored have
26 sharply increased.

27 The input-output connections allow two-way transmissions
28 between the card and various types of card readers, whether they
29 be card readers associated with stationary devices (cash
30 dispensers, automated teller machines or ATMs, devices

1 incorporated into an electronic cash register or a microcomputer,
2 etc.) or portable, such as a payment terminal (restaurants,
3 various stores) or a medical terminal.

4 All these devices have at least one characteristic in
5 common, i.e., an insertion slot or aperture into which the card
6 is inserted for purposes of a write and/or read operation. This
7 slot opens directly to the external environment and is large
8 enough to allow the penetration into the housing of the card
9 reader of small metal objects such as paper clips, or more
10 simply, particles or dust. The entry of such elements is even
11 easier, and thus more frequent, when the card reader is a
12 portable terminal capable of being moved to various places that
13 are, *a priori*, unprotected.

14 A card reader comprises electronic circuits and mechanical
15 elements that are extremely miniaturized. The objects or
16 polluting particles are therefore capable of creating
17 malfunctions, or even damaging some of these elements or
18 circuits.

19 The devices of the above-mentioned type, especially the
20 portable devices, or at least the portable devices, have other
21 drawbacks.

22 First of all, the general ergonomics of these devices are
23 not optimal. In particular, card readers of the type that can be
24 placed in the pocket of a garment must be as thin as possible and
25 are generally in the shape of a rectangular parallelepiped. When
26 they are placed on a table, it is relatively difficult to insert
27 the card into the slot, and the access to the keys of the
28 keyboard is not optimal, either.

29 Secondly, it often happens that the user forgets to remove

1 his card after use, particularly after he has entered his
2 confidential code by means of the keyboard. The card can remain
3 inside the card reader without the card holder's noticing it,
4 especially if the card reader is equipped with a cover.

5 The object of the invention is to provide a card reader,
6 particularly of a chip card, that eliminates the defects of the
7 devices of the prior art, some of which have just been mentioned.

8 To this end, the card reader according to the invention,
9 which includes a cover for protecting the keys of the keyboard
10 and its display unit, is equipped with a flap integral with the
11 cover that covers the insertion aperture when the device is not
12 in use, which prevents the entry of undesirable elements into the
13 device, even if the device is moved into a polluted environment.

14 In a preferred variant of the invention, the card reader is
15 provided with a configuration such that it can be presented to a
16 user so as to be inclined, which facilitates its handling and, in
17 particular, the entry of a confidential code.

18 In another preferred variant of embodiment, arrangements are
19 provided so that the flap cannot be in the closed position as
20 long as the card is present in the device, which prevents the
21 device from being closed without removing the card.

22 Hence, the subject of the invention is a card reading
23 device, particularly for a chip card, comprising a housing
24 equipped with data entry and display means, with a slot for
25 inserting said card into the housing and with a cover protecting
26 these data entry and display means, in a so-called closed
27 position, characterized in that it comprises a flap integral with
28 said cover and disposed so that it covers said insertion slot
29 when the cover is in said closed position.

1 The invention will be better understood, and other
2 characteristics and advantages will emerge with the reading of
3 the following description in reference to the attached figures,
4 in which:

5 - Fig. 1 represents, in a top view, an exemplary embodiment
6 of a card reader according to the invention, in the closed
7 position;

8 - Fig. 2 represents, in perspective and in a three-quarter
9 top view, this same card reader in a semi-open position;

10 - Fig. 3 shows a rear view of the card reader, in the open
11 position, as well as a chip card in the process of being
12 inserted;

13 - Fig. 4 shows a rear view of the card reader of Fig. 1, in
14 the closed position;

15 - Fig. 5 is a side view of the card reader, in the open
16 position, placed on a flat surface;

17 - Figs. 6 and 7 illustrate, in perspective and seen from the
18 rear, a variant of embodiment of the card reader according to the
19 invention;

20 - and Fig. 8 is a view illustrating an operational detail of
21 the card reader according to the invention.

22 An exemplary embodiment of a card reader according to the
23 invention will now be described in connection with Figs. 1
24 through 5.

25 Fig. 1 illustrates the card reader 1 in the closed position
26 (top view), and Fig. 2 (three-quarter top view in perspective)
27 illustrates this same card reader in a position that will be
28 called semi-open. In effect, the housing 10 of the card reader is
29 equipped with a protective lid or cover 2. The latter is attached

1 to the housing 10 by means of a hinge joint 3 disposed along one
2 of the walls of this housing 10. More precisely, this joint
3 comprises a double hinge, 30 and 31, whose operation and function
4 will be described in detail below.

5 A card reader normally comprises a display unit 4, most
6 often a liquid crystal display, and a data entry element
7 constituted by a keyboard 5, and keys 50 (alphanumeric keys and
8 function keys). The protective cover 2, in the example described,
9 completely covers the keyboard 5 and the display unit 4 when it
10 is in the closed position.

11 As has been indicated, the joint 3 comprises two hinges: a
12 first hinge 30 that mechanically couples the housing 10 to a
13 first edge of an intermediate piece 32, and a second hinge that
14 mechanically couples a second edge of this intermediate piece 32
15 to the protective cover 2.

16 The intermediate piece 32 has the shape of a rectangular
17 parallelepiped whose width is equal to half the width of the wall
18 (the right wall in Fig. 2) of the housing 10 to which it is
19 attached via the hinge 30. The hinge 30 is attached to the
20 housing 10 along an axis $\Delta 1$, parallel to the side edge of the
21 housing 10 and located at mid-height of the attaching wall.

22 These arrangements allow a rotation of the intermediate
23 piece 32 around the axis $\Delta 1$, and a rotation of the protective
24 cover around a second axis $\Delta 2$, parallel to the first one. It
25 follows that the protective cover 2 can be folded under the
26 housing 10 of the card reader 1, in the fully open position. A
27 latch (not represented) holds the cover 2 in the closed position
28 (Fig. 1).

29 For example, the cover 2 can be made of rigid plastic. The

1 intermediate strip 32 is advantageously made of a rigid material,
2 for example also of plastic.

3 According to a first variant of embodiment (not
4 illustrated), the cover 2 is mechanically coupled to the housing
5 10 by an articulated element consisting of a strip of plastic
6 comprising weakened areas (grooves, for example) that make it
7 possible to fold it in these areas. This strip therefore fulfills
8 the function of the double hinge 3 described above and allows the
9 cover 2 to be folded down and folded back underneath the housing
10 10, as above.

11 According to a second variant of embodiment (not
12 illustrated), the double hinge 3 is replaced by an articulated
13 element consisting of a simple strip of flexible material. In
14 this case, this strip also fulfills the function of the double
15 hinge 3 described above, and allows the cover 2 to be folded down
16 and folded back underneath the housing 10, as above.

17 According to a first important characteristic of the
18 invention, the card reader 1 is equipped with a movable mask or
19 flap 6 with a flat configuration. The shape of the flap 6 may be
20 seen in Fig. 2. The cover 2 is also essentially flat. The planes
21 formed by the cover 2 and the flap 6 are approximately
22 perpendicular to one another.

23 Fig. 3 represents (rear view in perspective) the card reader
24 1, in the fully open position. Also represented in Fig. 3 are a
25 card 7 comprising a chip 70, of a conventional model, that can be
26 used within the scope of the invention. Also seen in this Fig. 3
27 is an aperture or slot 8 for inserting the card 7 into the
28 housing 10 in order to be read and/or written on.

29 To facilitate the above-mentioned insertion, the housing 10

1 can be extended at the back by a lower plate 11, which serves as
2 a guide during this insertion operation and supports the card 7
3 once inserted.

4 Fig. 4 illustrates a rear view of the card reader, but with
5 the protective cover 2 completely closed. In this position, it
6 covers and protects the keyboard and the display unit 4. It will
7 also be noted that, according to an important characteristic of
8 the invention, the flap entirely covers the slot 8 and as a
9 result, prevents any introduction of a objects and miscellaneous
10 particles.

11 *A priori*, the flap 6 is made of a rigid material such as a
12 plastic, but can also be made of a flexible material such as
13 rubber that adapts to the exact shape of the wall comprising the
14 insertion slot 8.

15 Other advantageous characteristics of the invention will now
16 be described.

17 First, in a preferred embodiment of the invention, as a
18 result of the particular arrangements adopted for the hinge
19 system, or the articulated element that fulfills its function in
20 the additional embodiments, the protective cover 2 can be folded
21 all the way under the housing 10. It follows, as seen in Fig. 3
22 but even more clearly in Fig. 5 (side view), that since the flap
23 6 is integral with the cover 2, it accompanies its movement when
24 the latter is completely opened. It also ends up under the
25 housing 10, and as a result, it doubles the thickness of the
26 housing 10 of the card reader 1 at the level of the reading slot
27 8. If the card reader 1 is placed on a flat surface (the
28 practitioner's desk B, for example), it serves as a support base
29 at the level of the slot 8. The housing 10 of the card reader 1

1 rests so as to be inclined (angle α on the order of 15 to 20
2 degrees with the plane of the desk B), which facilitates the
3 insertion of the card 7 into the slot 8 (at the back in the
4 example described) and the access to the keyboard 5 (for example
5 so that the patient can enter his confidential code). It also
6 provides better perceptibility of the display of the data
7 (improved angle of incidence).

8 Secondly, when the card 7 is present in the slot 8, it
9 becomes impossible to close the cover 2. In fact, in a preferred
10 embodiment, the depth of the insertion slot 8 is smaller than the
11 maximum length of the chip card 7. It follows that the card 7
12 projects outward from the housing 10, even though it is inserted
13 normally into the reading slot 8, which does not interfere with
14 the normal read and/or write operations. For example, the length
15 of the projection is about 2 cm. In the presence of the chip card
16 7, the user of the card reader 1 cannot close the card reader 1,
17 since the cover comes to rest against the card 7. It must
18 therefore of necessity be removed in order to be returned to its
19 holder.

20 In the variants that have just been described, the double
21 hinge 3, or the element that fulfills its function, are disposed
22 on the right or left side of the housing 10. This disposition
23 allows one drawback to remain, as illustrated schematically by
24 Fig. 8. In effect, when the cover 2 is closed, if the card 7 is
25 still inserted in the slot 8, the cover 2 exerts a shearing force
26 on its edge 71, since it acts like a blade.

27 Also, in an additional variant illustrated by Figs. 6 and 7,
28 instead of disposing the double-hinge joint on the long side of
29 the housing of the card reader, it is located on what is referred

1 to as the "front" of the housing 10, i.e., on one of the short
2 sides.

3 In Figs. 6 and 7, the card reader is referenced 1' and the
4 double-hinge joint 3'. The elements common to the preceding
5 figures have the same references and will be described again only
6 as necessary.

7 This disposition is advantageous because, if the double-
8 hinge joint 3' is located on the front of the housing 10, when
9 attempting to close the flap 6 while the card 7 is present, (as
10 shown more particularly in Fig. 6) in the reading slot 8, the
11 flap 6 butts against the entire width of the card 7. It follows
12 that it cannot break it, even if forced.

13 Finally, the housing 10 can advantageously be equipped with
14 a switch or a similar element 9, operated by the flap 6. This
15 switch 9 is disposed on the wall equipped with the slot 8 for
16 inserting the card 7 and cuts off the electric power supply of
17 the electronic circuits present in the housing 10 (not
18 represented) when the flap 6 is in the fully closed position, and
19 automatically re-establishes this supply when the cover 2 is
20 opened, and hence when the flap 6 is moved away.

21 Naturally, this advantageous disposition is compatible with
22 the first embodiment described in connection with Figs. 1 through
23 6, even though the switch 9 has not been explicitly represented
24 in these figures.

25 Finally, for certain applications, it is not necessary to
26 return the card 7 to its holder after use, and it can remain in
27 the reading slot 8 without any drawbacks. For this type of
28 application, it may on the contrary be advantageous to keep it in
29 the reading slot 8. To this end, a slot 8 is provided that is

1 deep enough to completely "swallow" the card 7. In other words,
2 the length of the slot 8 must be at least equal to the maximum
3 length of the card 7. Thus, the latter remains protected inside
4 the reading slot 8. In fact, it is held inside by the flap 6 when
5 the cover 2 is closed, so that the housing 10 serves as a
6 protective case.

7 With the reading of the above, it is easy to see that the
8 invention clearly achieves the objects set forth.

9 The presence of the flap, when the card reader is not in
10 service and the cover is closed, prevents any entry of
11 undesirable elements, particularly small metal objects such as
12 paper clips, or even dust and miscellaneous particles, and more
13 generally any element that is dangerous to its proper
14 functioning.

15 Furthermore, because of the "support base" function
16 fulfilled by the flap when the cover is completely open, it
17 allows for better ergonomics, since the housing is in an inclined
18 position.

19 Finally, according to a first variant, the flap makes it
20 impossible to leave the card inside the housing when the cover is
21 closed, or conversely, in a second variant, when the reading slot
22 is deep enough for the card to be fully inserted into the
23 housing, the flap prevents the intrusion of elements that are
24 dangerous to the card (especially to its chip), and together with
25 the housing, contributes to forming a protective case for this
26 card.

27 It should be clear, however, that the invention is not
28 limited to only the exemplary embodiments explicitly described,
29 specifically in relation to Figs. 1 through 8.

1 The materials that can be used are essentially tied to the
2 specific application intended and are determined by a simple
3 technological choice within the capability of one skilled in the
4 art.

5 Likewise, the terms "under," "top," "front," "sides," or
6 "back" relative to the housing are purely arbitrary. Lastly, the
7 slot for inserting the card can be placed not only at the back as
8 has been described, but on any lateral wall. The flap need only
9 be positioned relative to the cover so that this slot is
10 obstructed when the cover is closed.

11 Nor is the invention limited to applications using chip
12 cards. On the contrary, the card can be of any type whatsoever:
13 magnetic card, mixed card (chip and magnetic stripe),
14 piezoelectric card, etc.

15 Moreover, the card reader can be applied to the following
16 additional functions: calculator, electronic calendar, etc.,
accessible via the keys of the keyboard and the display unit.

CLAIMS

1
2
3 1. Card reading device (1), particularly for a chip card
4 (7), comprising a housing (10) equipped with data entry (5) and
5 display (4) means, with a slot (8) for inserting said card (7)
6 into the housing (10) and with a cover (2) protecting these data
7 entry (5) and display (4) means, in a so-called closed position,
8 characterized in that it comprises a flap (6) integral with said
9 cover (2) and disposed so that it covers said insertion slot (8)
when the cover (2) is in said closed position.

1 2. Device according to claim 1, characterized in that,
2 said cover (2) being able to fold under said housing (10) when it
3 is in a so-called open position, said flap (6) serves as a
4 support base when the housing (10) is placed on a supporting
5 surface (B), at the level of said insertion slot (8), so that the
6 housing (10) is presented to a user so as to be inclined (α)
relative to said support surface (B).

1 3. Device according to claim 1, characterized in that said
2 flap (6) and said cover (2) are essentially flat, and in that the
3 planes formed by the flap (6) and the cover (2) are approximately
perpendicular to one another.

1 4. Device according to claim 2, characterized in that said
2 cover (2) is mechanically coupled to said housing (10) by an
3 articulated element (3) that allows it to cover the housing (10)
4 in said closed position, and to be folded under the housing (10)
5 in said open position so that said flap (6) forms said support

base.

1 5. Device according to claim 4, characterized in that said
2 articulated element (3) is a double hinge constituted by a
3 rectangular parallelepipedic element (32) of predetermined width,
4 equipped on a first edge with a first hinge (30) and on a second
5 edge, parallel to the first one, with a second hinge (31), and in
6 that the first hinge (30) mechanically couples the cover (2) to
7 said rectangular parallelepipedic element (32), and the second
hinge (31) couples the latter to said housing (10).

1 6. Device according to claim 5, characterized in that said
2 housing (2) being approximately in the shape of a rectangular
3 parallelepiped, said rectangular parallelepipedic element (32) is
4 a strip of rigid material whose width is equal to half the width
5 of the wall constituting this side, and in that said first hinge
6 (30) is attached along the middle of this wall, so that said
7 cover (2) can be folded under the housing (10), when it is in
8 said open position and so that said flap (6) serves as a support
base on a supporting surface (B).

1 7. Device according to claim 1, characterized in that said
2 insertion slot (8) has a depth smaller than the maximum length of
3 said card (7), so that said flap (6) is blocked and said cover
4 (2) cannot be positioned in said closed position as long as the
card (7) remains in the insertion slot (8).

1 8. Device according to claim 1, characterized in that said
2 insertion slot (8) has a depth at least equal to the maximum

length of said card (7), so that its presence in the insertion slot does not prevent the closing of said cover (2) and so that said housing (10) can serve as a protective case for this card (7) when the housing (10) and said flap (6) are in said closed position.

9. Device according to any of the preceding claims, characterized in that said housing (10) is extended, on the wall equipped with said insertion slot (8) by a plate for guiding said card (7) during its insertion into the insertion slot (8).

10. Device according to any of the preceding claims, characterized in that the housing (10) comprises a switch (9) on the wall equipped with said insertion slot (8) and in that said switch (9) is operated by said flap (6) so as to cut off or re-establish the electric power supply of the electronic circuits present in the housing (10).

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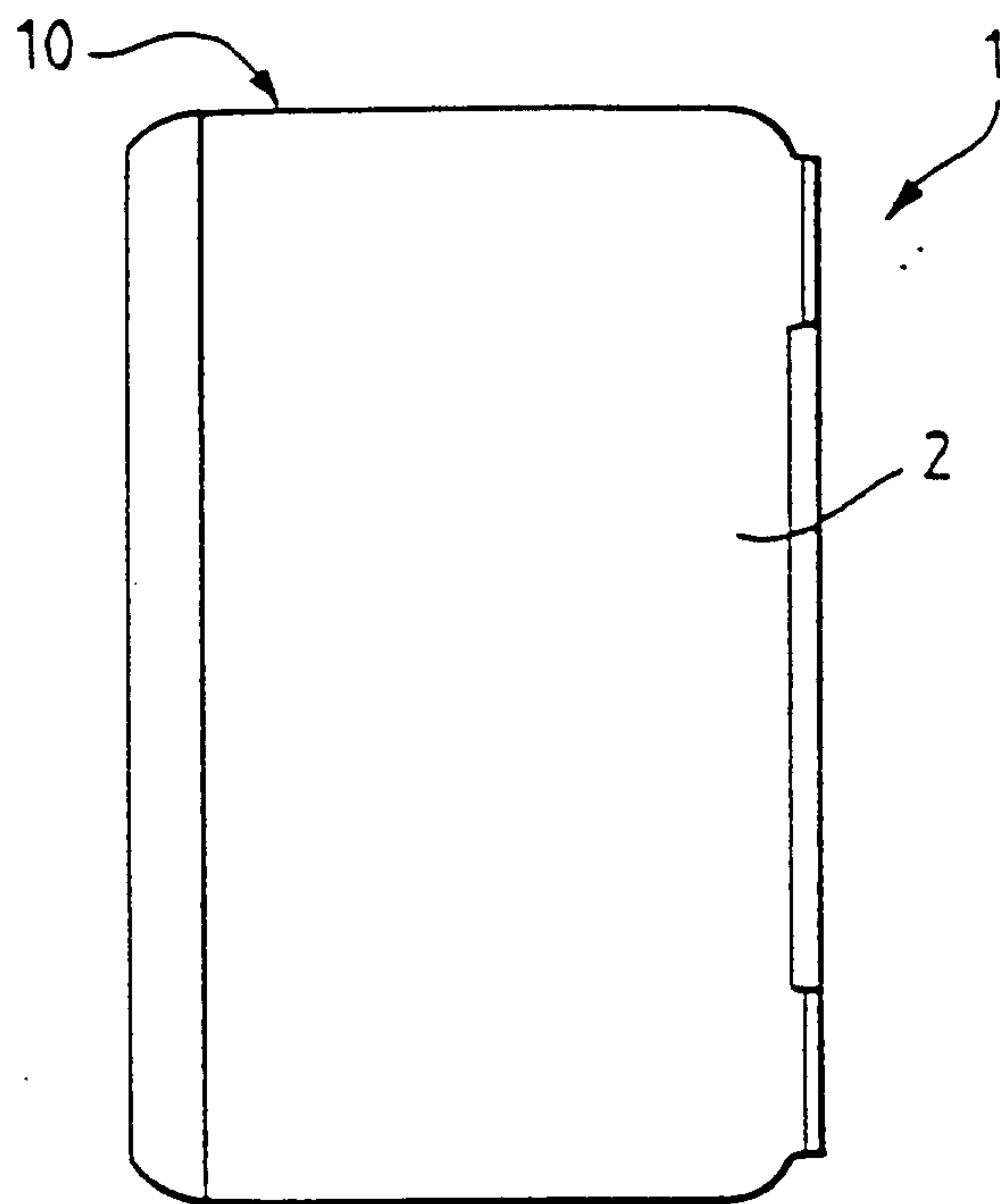


FIG. 1

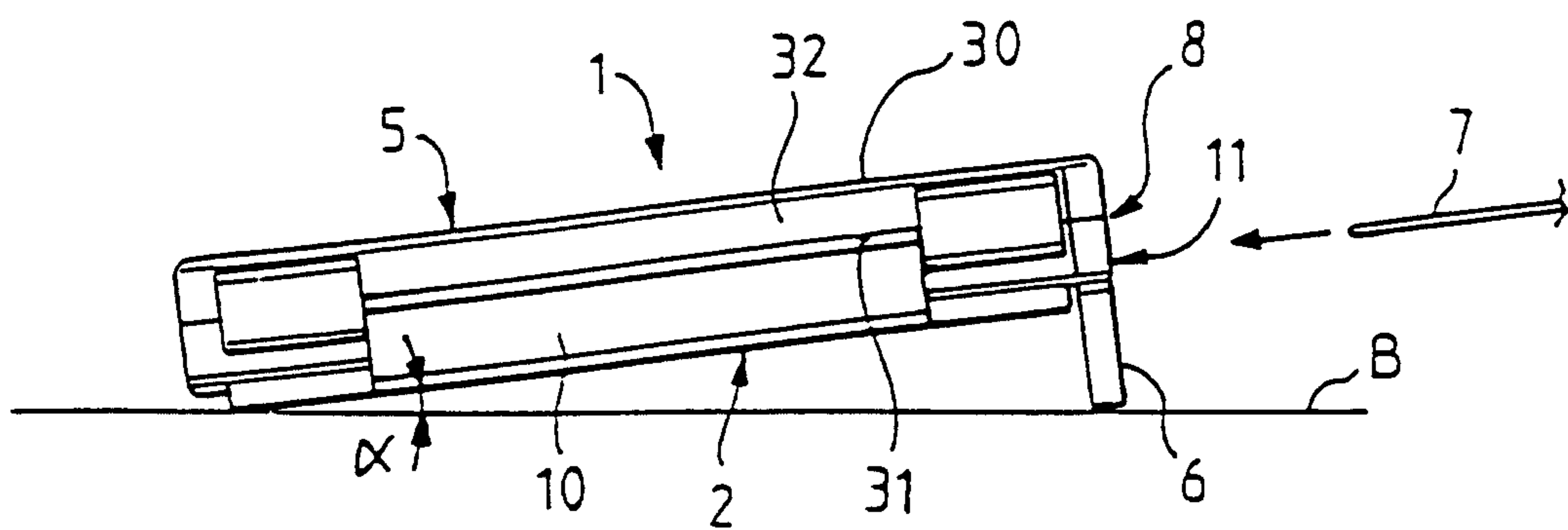


FIG. 5

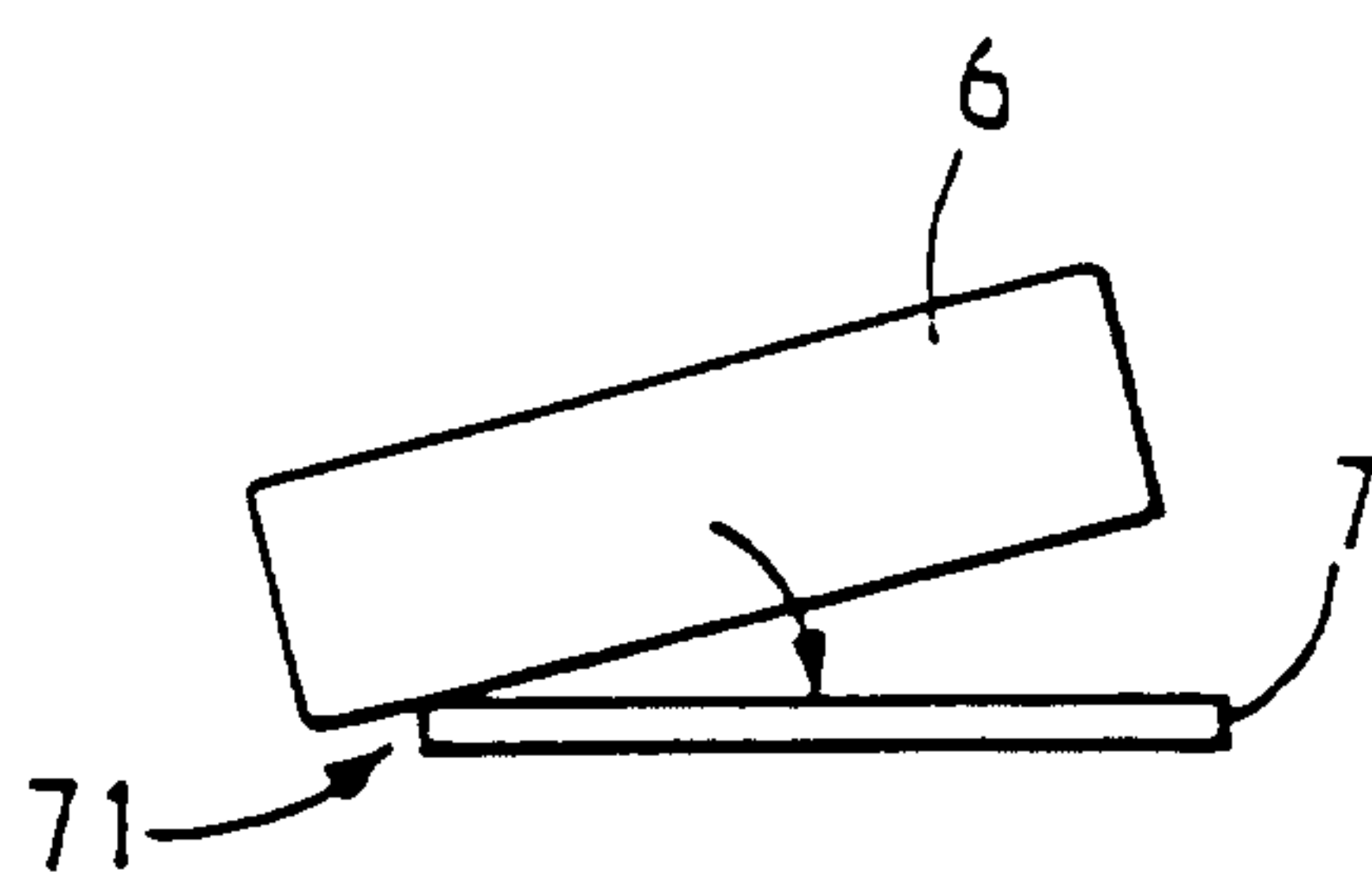


FIG. 8

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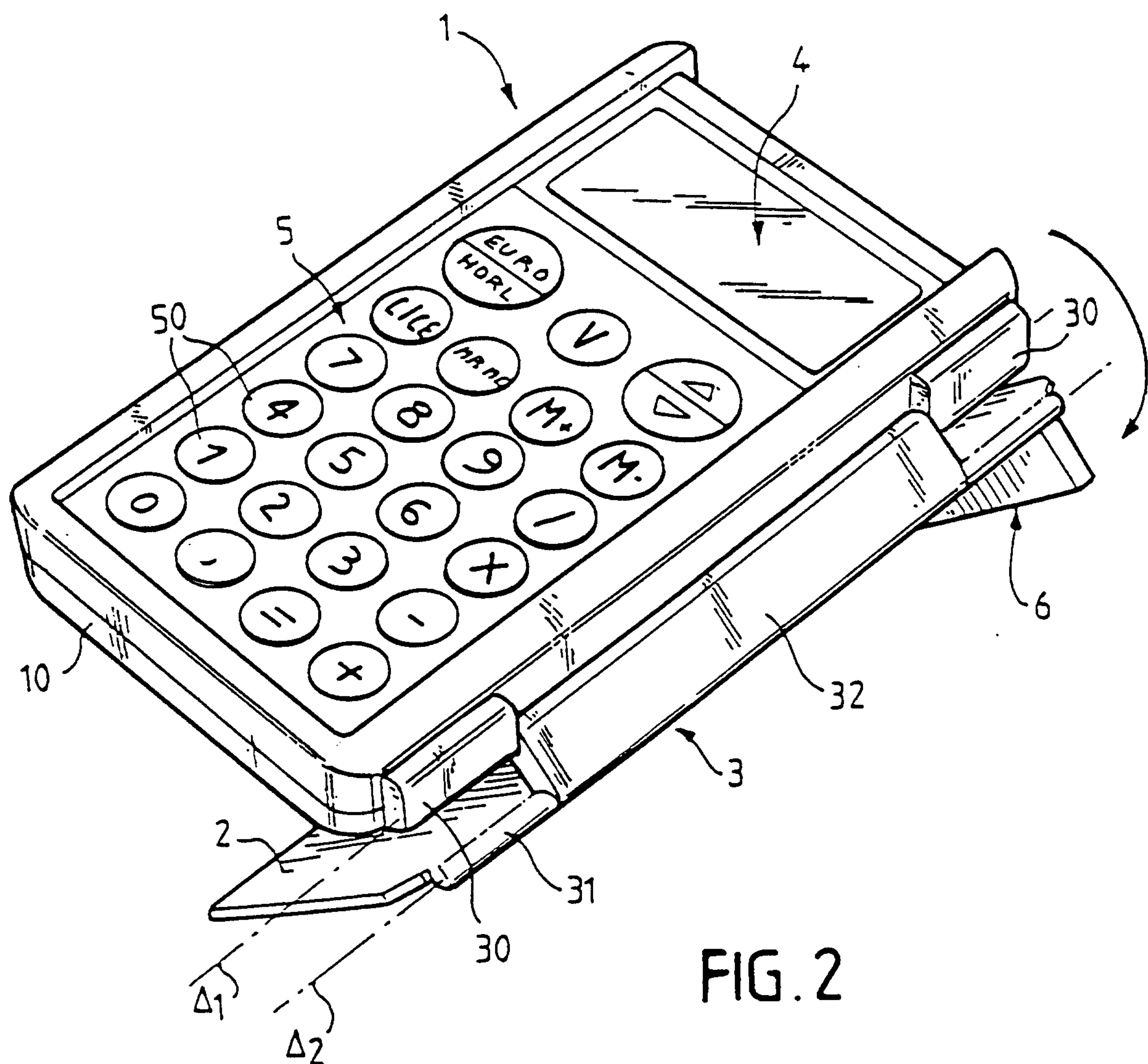


FIG. 2

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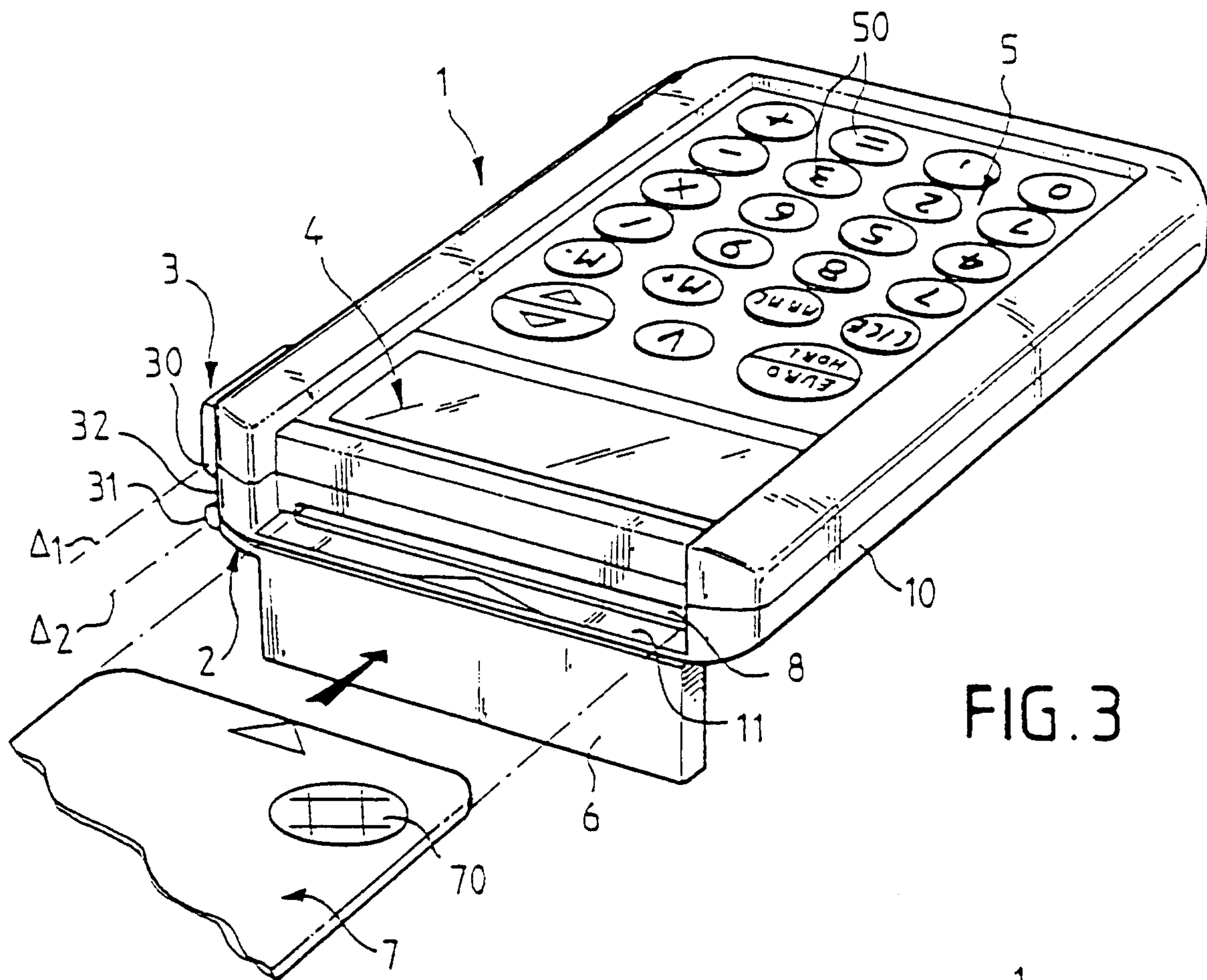


FIG. 3

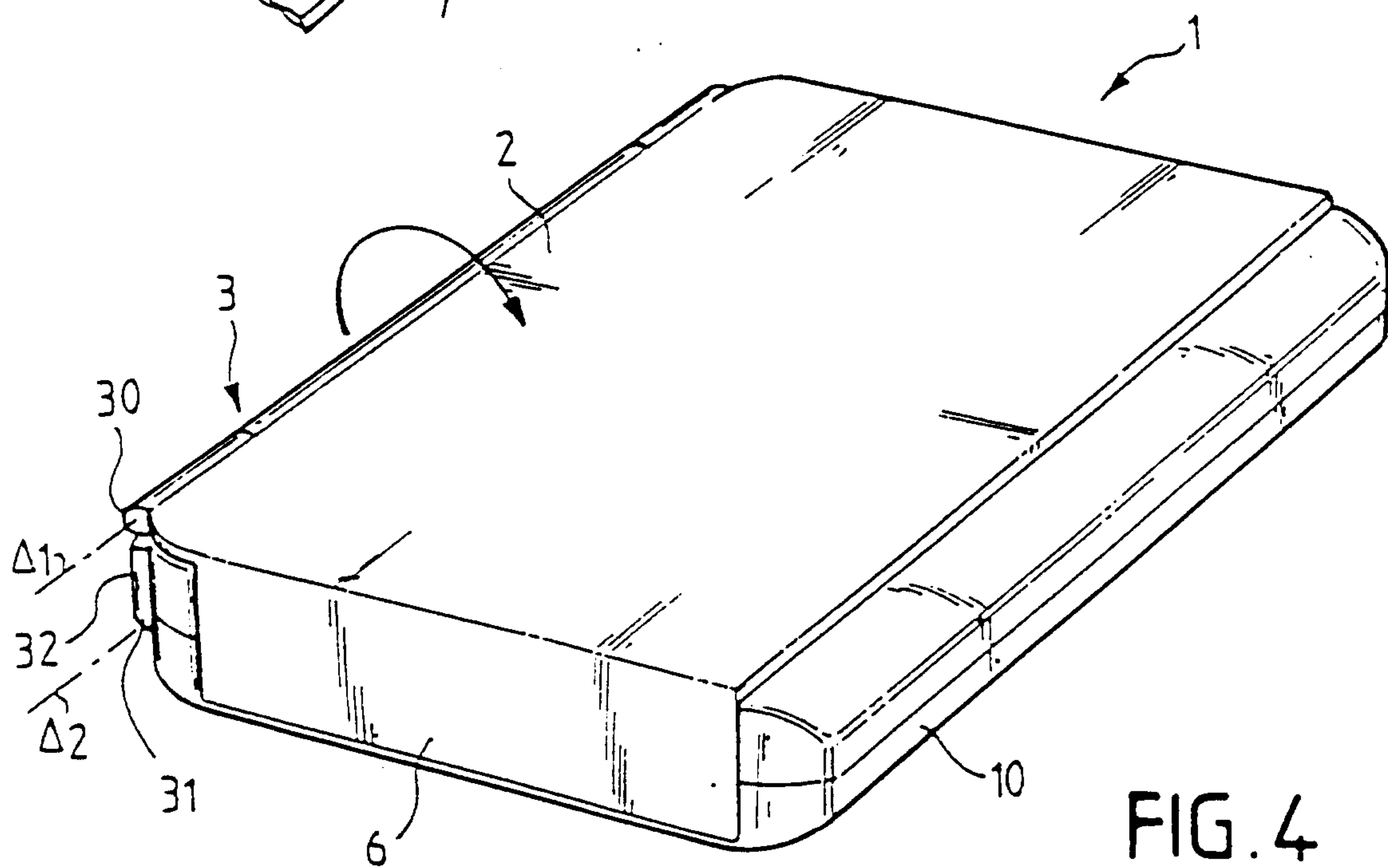


FIG. 4

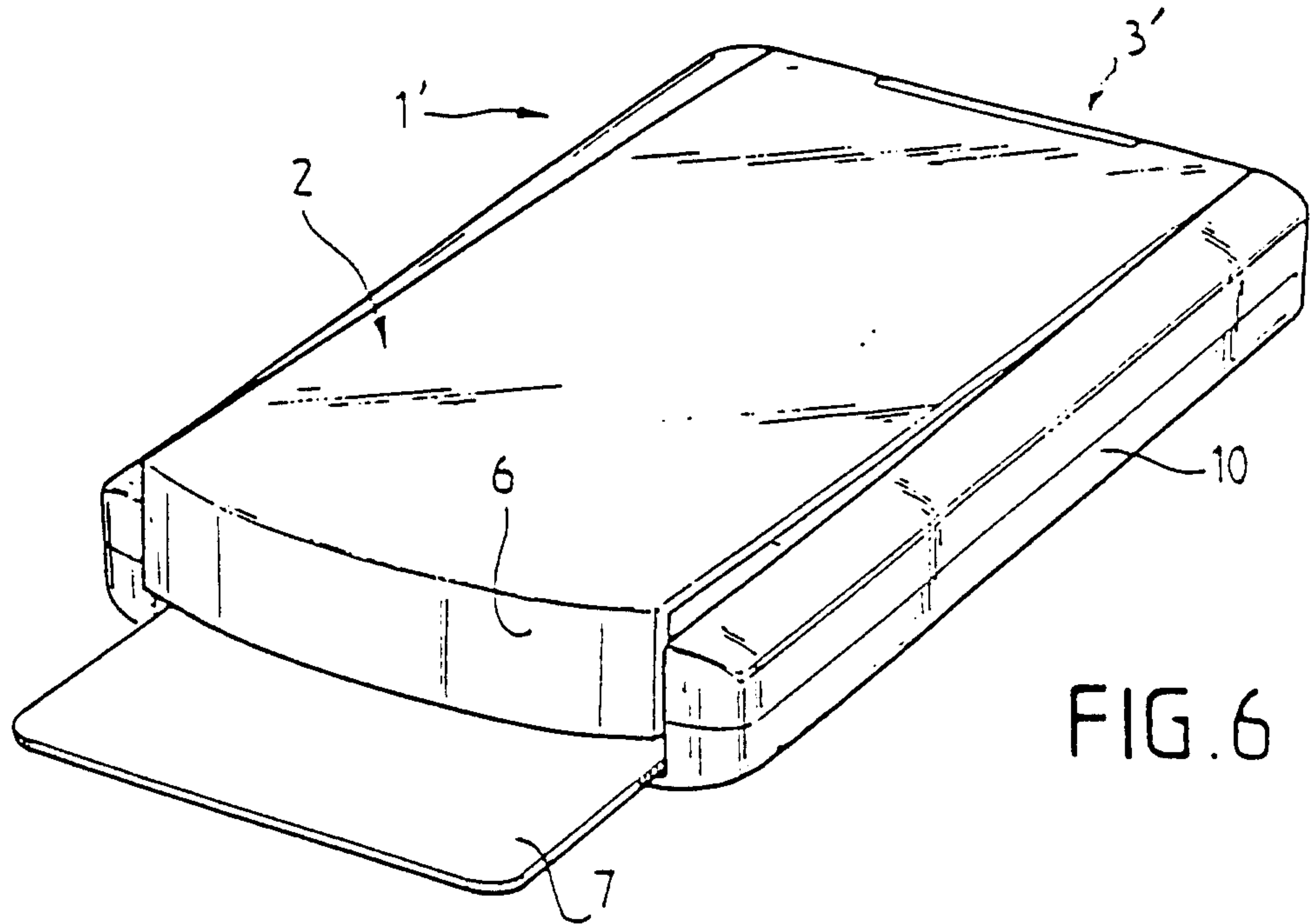


FIG. 6

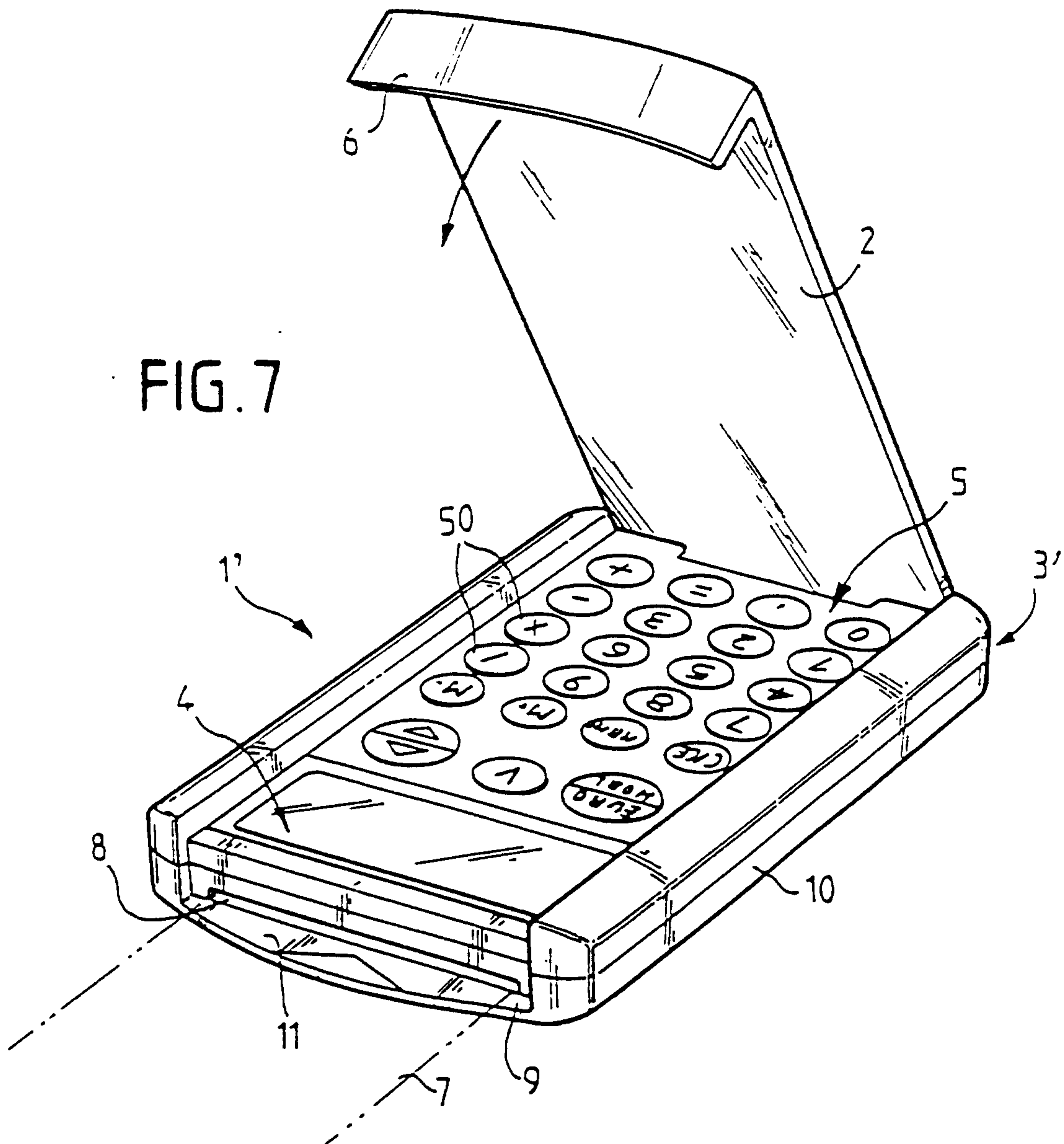


FIG. 7