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(54) **SLIDE SECURING DEVICE FOR FLATBED SCANNING SYSEM**

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Related U.S. Patent Documents

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Appl. No.: **09/588,642**
PCT Filed: **Jun. 7, 2000**

(51) **Int. Cl.**
H04N 1/04 (2006.01)
G03G 15/00 (2006.01)

(52) **U.S. Cl.** **358/487; 358/474; 358/497; 399/378; 355/75**

(58) **Field of Classification Search** **358/487, 358/474, 497, 506, 505, 471, 400; 399/378, 399/377; 355/75; 250/234-236; 353/120, 353/108, 103; 382/312, 318, 319**

See application file for complete search history.

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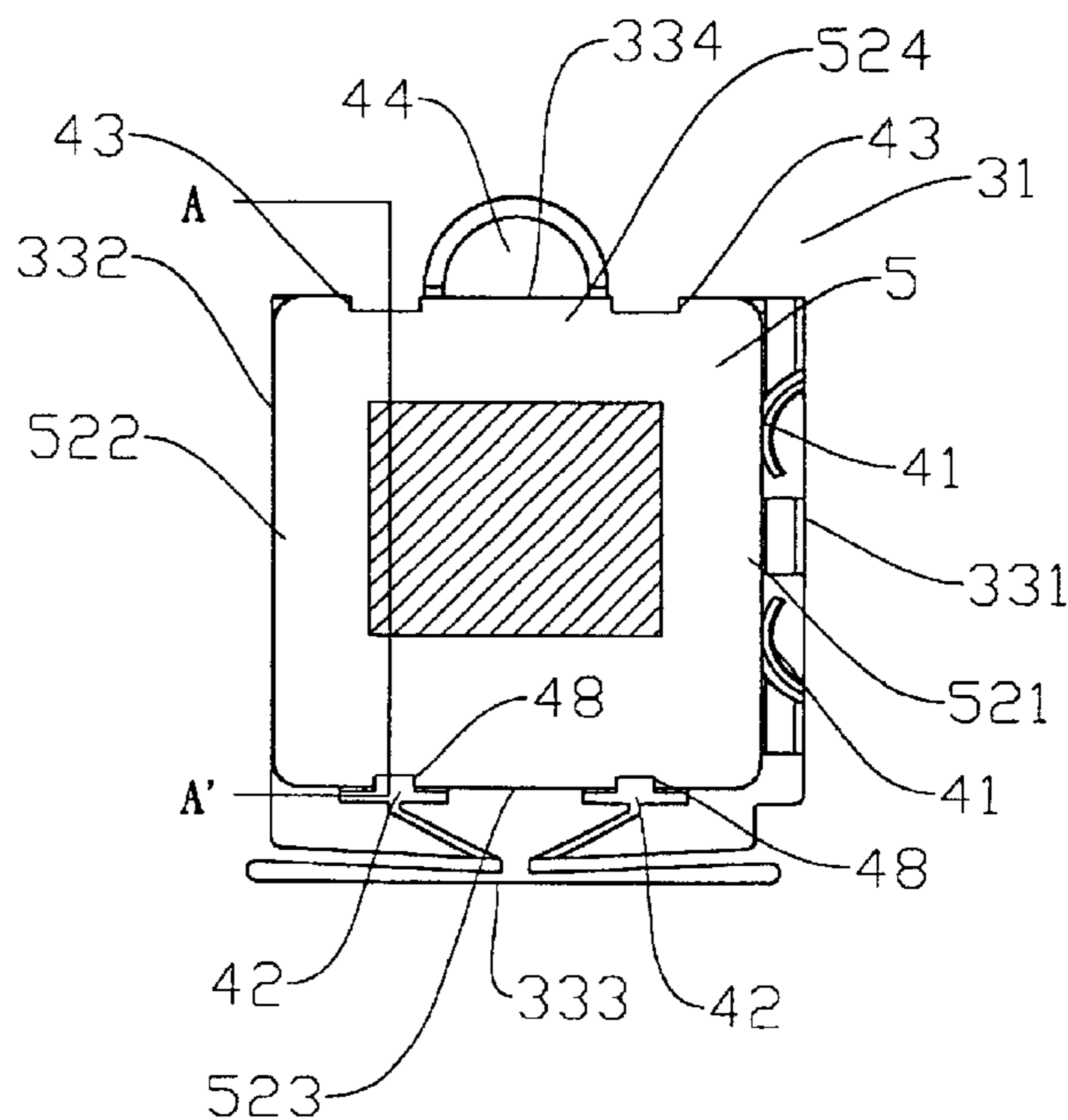
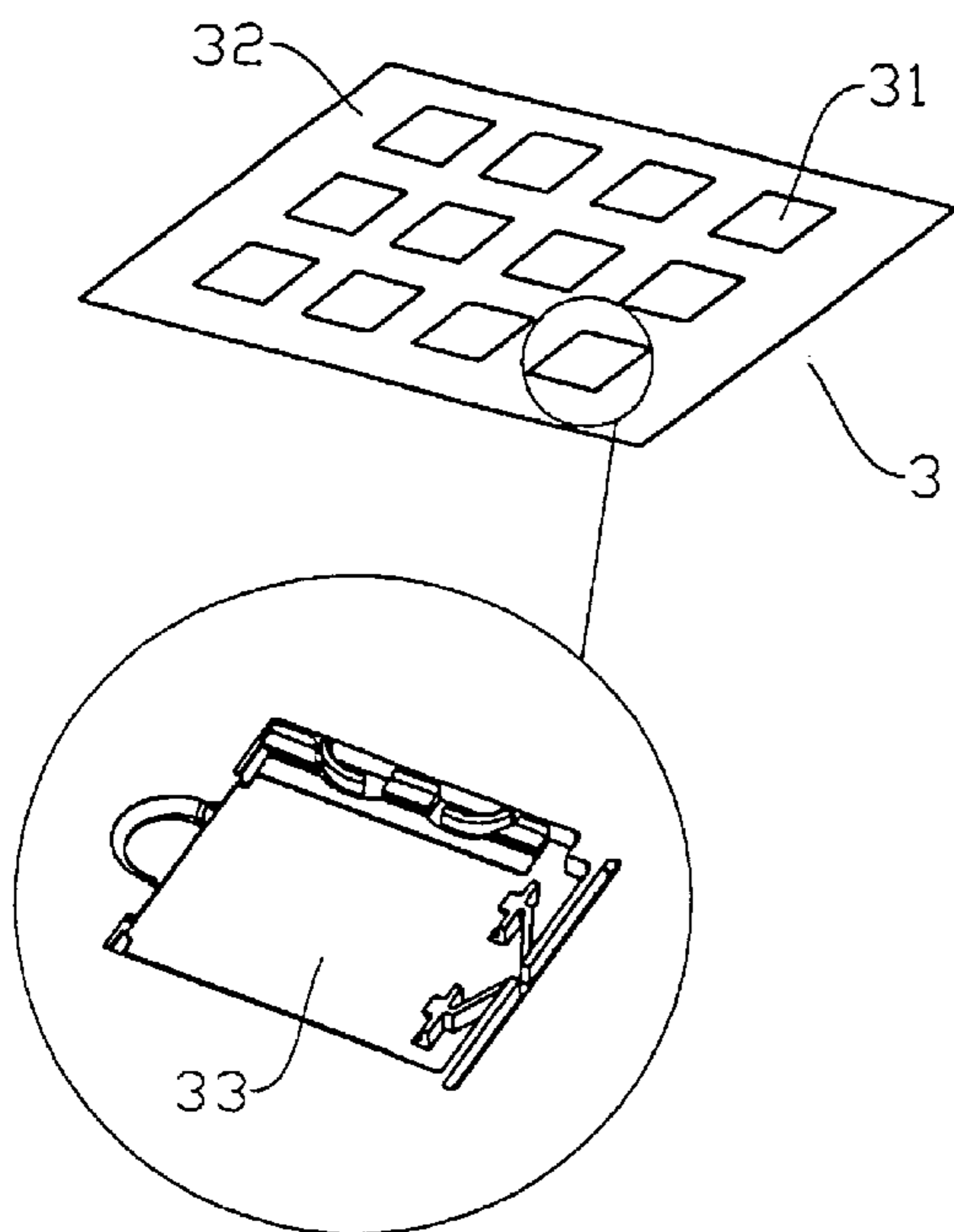
* cited by examiner

Primary Examiner — Cheukfan Lee
(74) *Attorney, Agent, or Firm* — Perkins Coie LLP

(57) **ABSTRACT**

A slide securing device, using in a flatbed scanner, includes a frame and a securing cell. The securing cell comprises an aperture, a first securing clip, a second securing clip, a first securing groove, a second securing groove, a picking portion, a first support member and a second support member. The slide securing device utilizes proper clips for holding slides. Thus, the scanner can directly scan the secured slides by predetermined parameters and reset mode, in order to save scanning time. Further, the securing grooves maintains slides at a fixed height to improve the scanning quality.

40 Claims, 7 Drawing Sheets



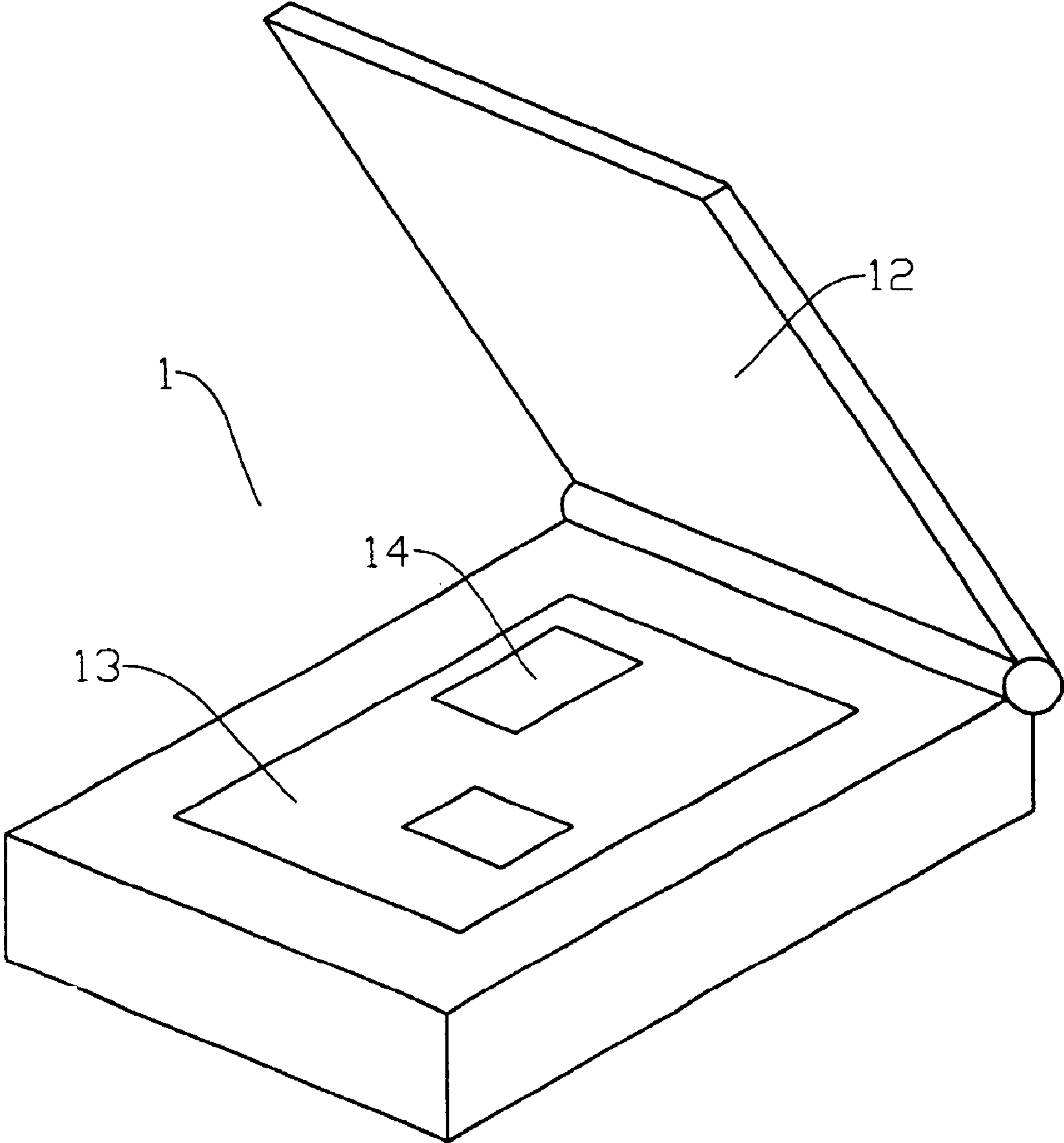


Figure 1(PRIOR ART)

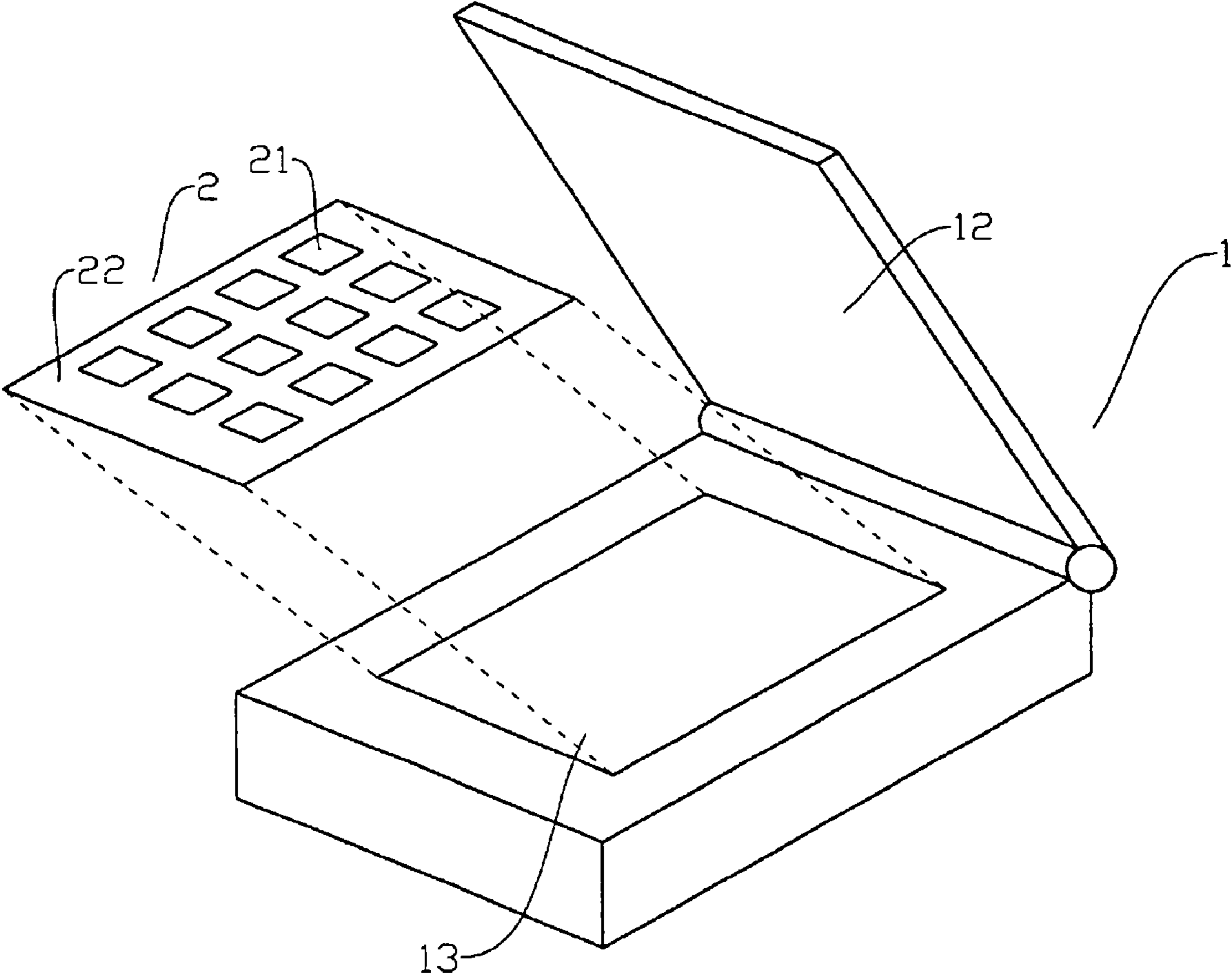


Figure 2(PRIOR ART)

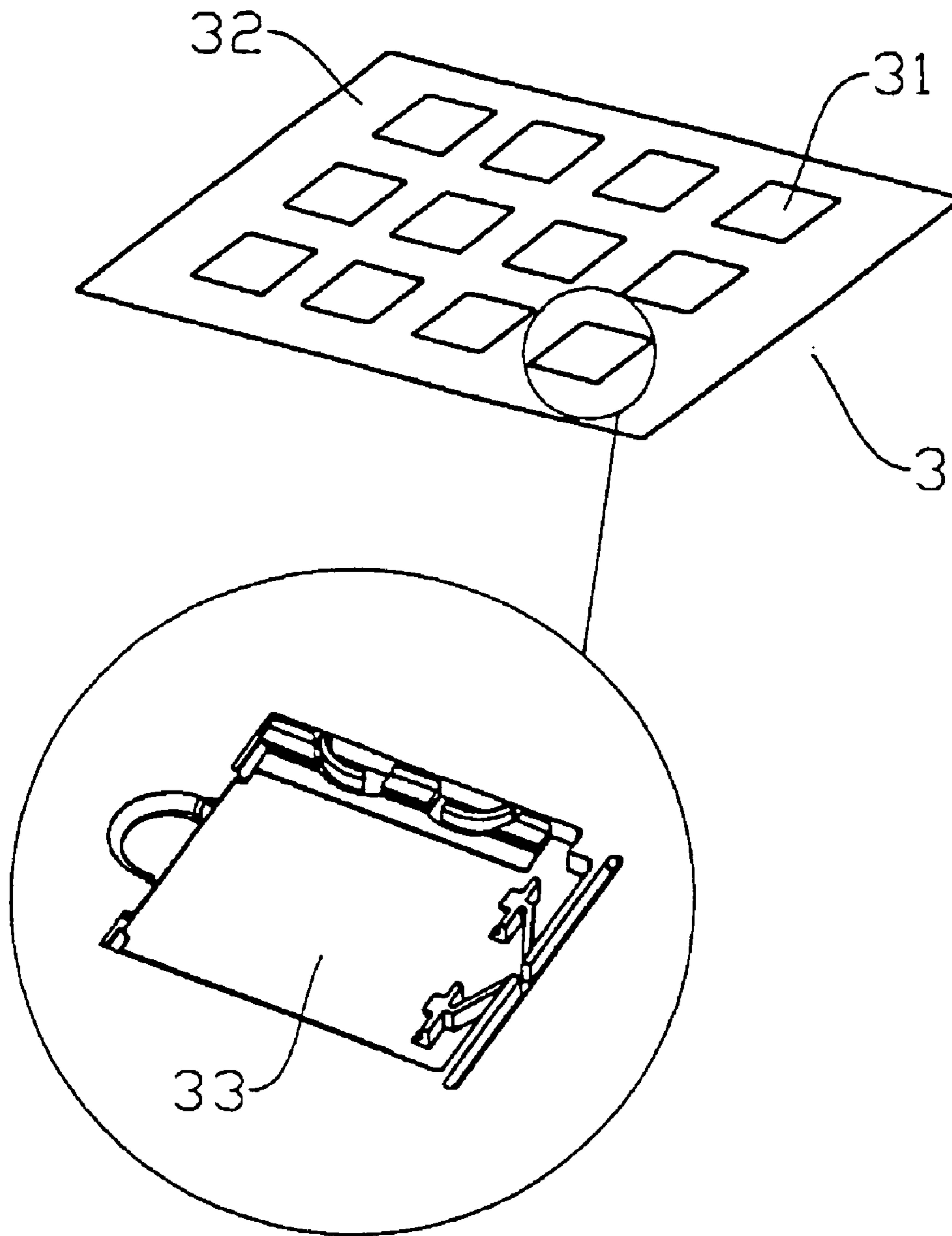


Figure 3

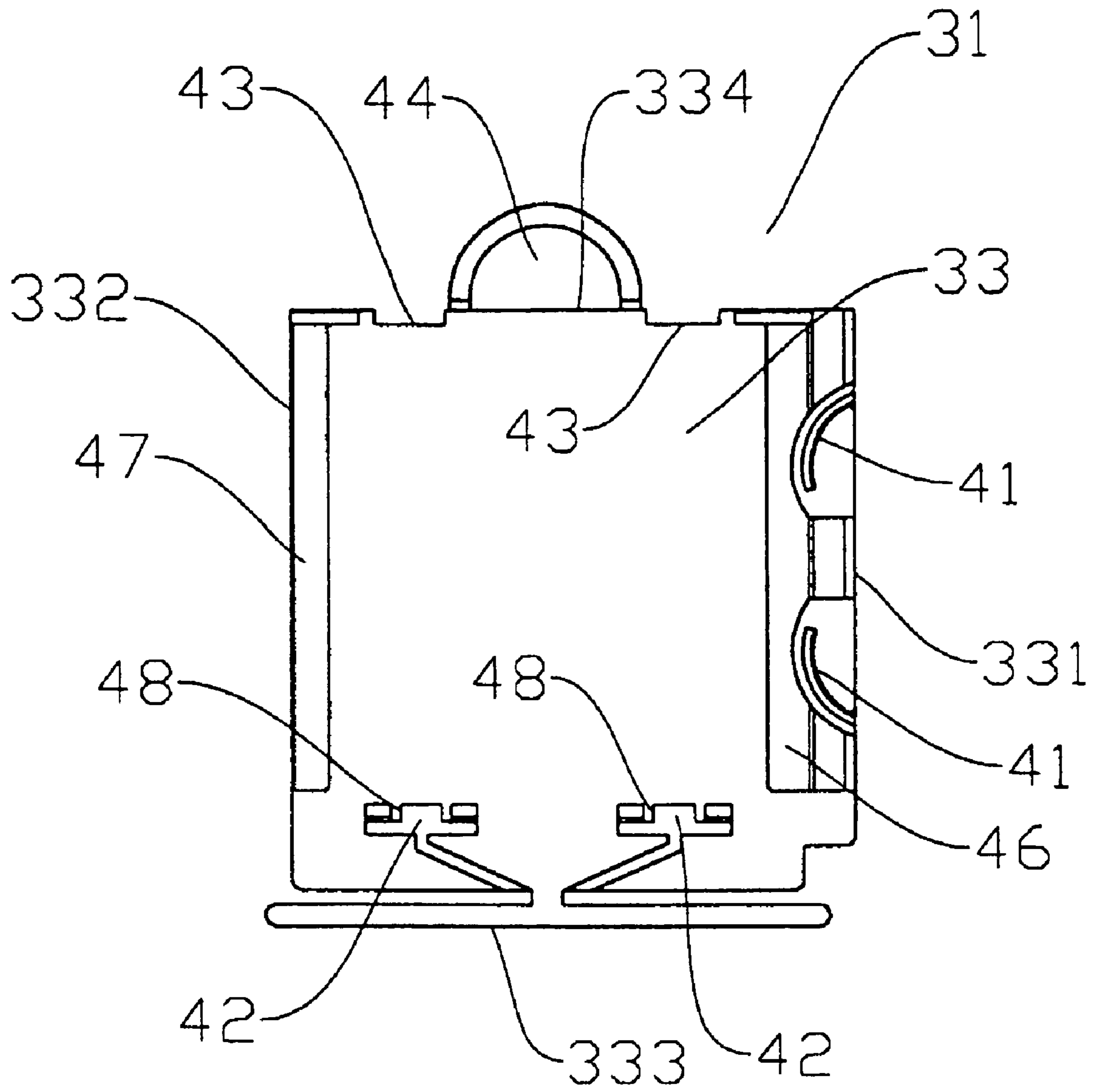


Figure 4

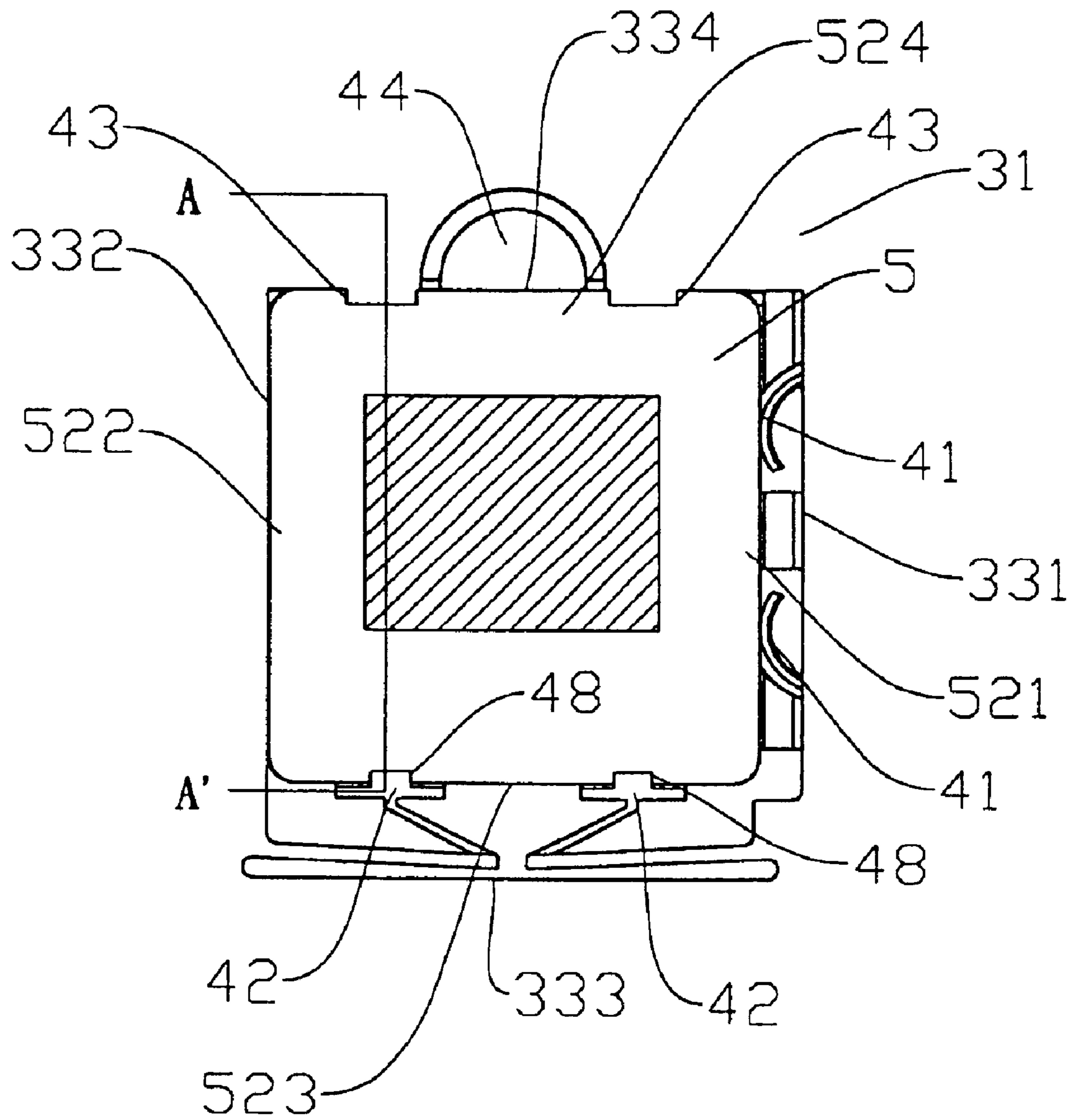


Figure 5

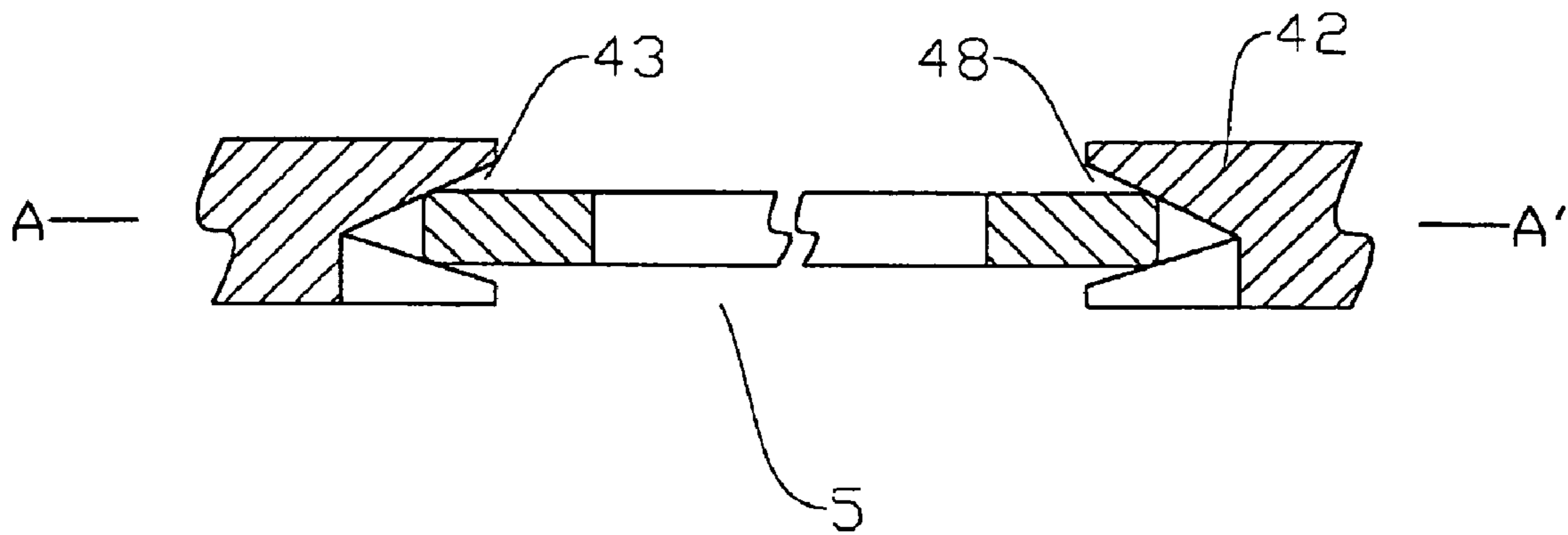


Figure 6

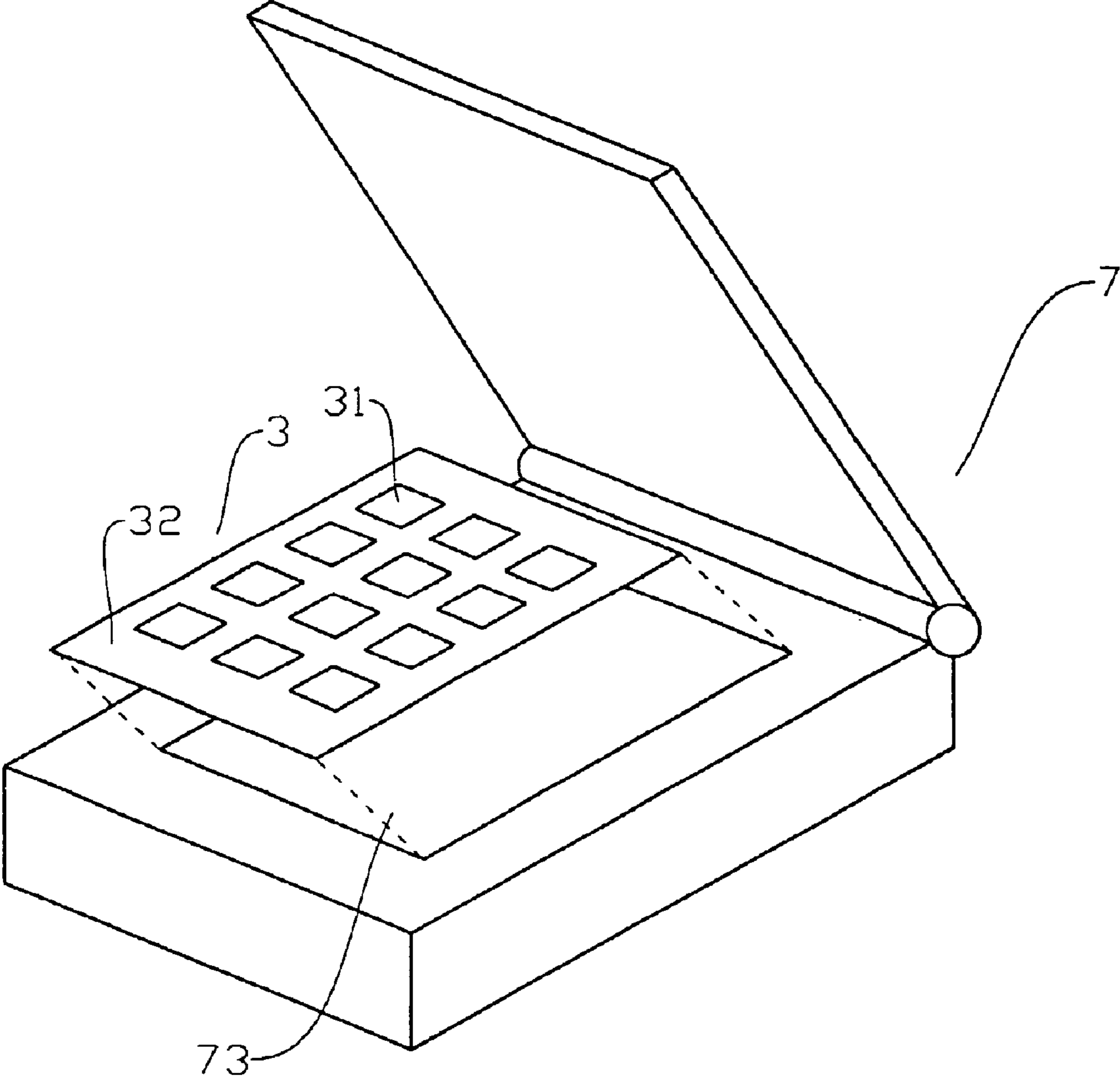


Figure 7

SLIDE SECURING DEVICE FOR FLATBED SCANNING SYSEM

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to an apparatus for mounting slides. Specifically, the present invention is a slide securing device using in a flatbed scanner.

2. Background Description

Nowadays flatbed scanners are fully developed computer accessories available on the consumer market. The flatbed scanner can scan colorful documentation and black-white documentation into computer files in order to preserve ordinary images or pictures. The flatbed scanner can also scan particular transparent documents, such as slides or films, by changing the light path from other direction. The transparent scanning operation can be well done in the same manner as ordinary scanning operation.

In the operation for scanning general colorful or black-white documents, the sizes of the documents usually are regular sizes, such as A4, A3, Letter or B5. The flatbed scanner is therefore comprising a document glass for positioning an original document to be scanned. Thus, for the regular sizes, the user simply follows the instructions, such as placing the original document to a predetermined position of the document glass of the scanner, selecting a corresponding size of the original document, and setting parameters of the scanning conditions in a driver program. The scanner will scan the original document by the settings. The scanner is therefore able to scan different documents by acquiring different settings.

Referring to FIG. 1, however, in case of scanning slides, the sizes of slides are regulated but differing from A3, A4, B4, or Letter size. Actually, the sizes of slides are much smaller than the area of the document glass 13. Thus, the user can scan several slides 14 at one time in order to save scanning time. Problems are occurring by this kind of operation. The user is usually unable to align several slides 14 on the document glass 13. Therefore, it is necessary to preselect the positions of each slide 14 from the selection feature provided by the driver program, before main scanning process. By this preselection, the scanner can scan the slides. Nonetheless, the auxiliary process of preselecting slides from the driver program consumes the operation time and causes user's inconvenience.

To solve the above-mentioned problem, a driver software implementing an automatic slide locating feature is available on the market. However, it still takes lots time to locate and scan the slides. Because the sizes of slides are regulated, it is still not efficient if a process of preselecting slides' location is needed.

Thus, there is a locating device provided for scanning original objects which have regulated sizes, for example, slides. The locating device is provided for the scanning process in a flatbed scanner. Referring to FIG. 2, the locating device 2 comprises a frame 22 and at least one opening 23. First, the frame 22 is positioned on the document glass 13. Next, slides are placed in the opening 23 (slides not shown) in

order. After placing down the cover 12, start the scanning program by a predetermined scanning mode. The scanned images are then acquired.

The frame 22 of the locating device is usually made by a soft plastic material. There are several openings as the similar size of slides. However, there is not featured any fixation mechanism in the mentioned locating device. Therefore, the locating device cannot provide precise positions of slides during scanning. Moreover, even though the size of slides is regulated, the thickness of the frame of the slides will vary in different framing brands. The variant thickness of the slide frames will cause diffusion of the scanned image because the scanner cannot precisely focus on slides which have different thickness.

In Taiwan Utility Patent (Republic of China Utility Patent) No. 294,428, there is disclosed a fixation device. Once a frame holds several slides, the frame is placed into a holding member. The holding member is then inserted to a dedicated scanner for transparent scanning process. Thus, the holding member needs an upper and a lower portions for holding the frame. In addition, the dedicated scanner must implement a particular apparatus in order to scan slides via a particular method. This operation is too complicated and inconvenient to the user. In addition, because the slide is only secured by one clip, the slide is able to slip to another position. It causes differences between the actual slide position and predetermined position in the driver program. The actual slide position therefore cannot be acquired. Further, the focus of the scanner cannot be precisely achieved since the slides are not fully secured in a predetermined position and at a fixed height.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide an apparatus for securing slides on a scanning system in order to acquire precise quality of scanned images.

According to the present invention, the securing cell includes plural clips to mount slides. The scanner is able to directly scan the slides by a predetermined scanning mode in order to save scanning time. Further, the present invention secures slides at a fixed height. The scanner can scan slides by a fixed focus. The scanning quality is therefore improved.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages will be better understood from the following detailed description of a preferred embodiment of the invention with reference to the drawings, in which:

FIG. 1 is a general scheme of prior slide scanning process;

FIG. 2 is another slide scanning process of prior art;

FIG. 3 is the slide frame of the present invention;

FIG. 4 is a top plan view of the securing cell of the present invention;

FIG. 5 is a top plan view showing a slide is secured in the securing cell of the present invention;

FIG. 6 is a cross section view along A-A' line shown in FIG. 5; and

FIG. 7 is a general scheme showing the slide scanning device placed on the document glass of the flatbed scanner.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

Referring to FIG. 3, there is shown the slide securing device 3 for securing slides on the document glass of the

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flatbed scanner. The slide securing device 3 includes a frame 32 and at least one securing cell 31. The frame 32 can be placed on the document glass of the flatbed scanner, as convention method illustrated in FIG. 2. The securing cell 31 comprises an aperture 33. The area of the aperture 33 is larger than a slide. The slide is therefore able to be placed in.

The present invention will be advanced details in view of FIGS. 4, 5 and 6. FIG. 4 is showing the securing cell 31 in details. FIG. 5 is showing a slide mounted in the securing cell 31 in details. FIG. 6 is the cross section view along A-A' line.

In FIG. 4, there is shown that the securing cell 31 has at least a first securing clip 41 and a second securing clip 42. The first securing clip 41 is positioned on the first side 331 of the aperture 33 to provide securing force along the first edge 521 of the slide 5. Thus, the second edge 522 of the slide 5 is able to attach the second side 332 of the aperture 33 by the force from the first securing clip 41. The second securing clip 42 is positioned on the third side 333 of the aperture 33 to provide securing force along the third edge 523. By the securing force, the fourth edge 524 of the slide 5 is able to securely attach to the fourth side 334 of the aperture 33. The main structure of the present invention is illustrated above. The present invention utilizes securing force from two different directions, especially perpendicular directions, to secure the slide 5. The secured slide 5 will not slip or move after the employment of two direction securing force and corresponding reactive force from respective opposite sides of the aperture. Once the securing device 3 is placed on the document glass, the scanner is therefore able to precisely scan the secured slides in the securing device 3 by predetermined parameters and mode.

Further, the aperture 33 includes a first receiving groove 43 and a second receiving groove 48. FIG. 6 shows the cross view of the grooves along line A-A'. The first receiving groove 43 is located on the fourth side 334 of the aperture 33. The fourth edge 524 of the slide 5 attaches the first receiving groove 43 due to the force provided by the second securing clip 42 pushing the third edge 523 of the slide 5. The second receiving groove 48 is located on the same side of the second securing clip 42, and faces to the slide 5. The second receiving groove 48 and the first receiving groove 43 are on the same plane. Once the second securing clip 42 pushes the third edge 523 of the slide 5, the second receiving groove 48 secures the third edge 523 of the slide 5. Because of the force provided by the second securing clip 42, the slide 5 is secured between the first receiving groove 43 and the second receiving groove 48. Due to the grooves are V shapes, the slide 5 which is mounted in the securing cell 31 is not able to move or slip. Thus, the slide 5 is capable of maintaining a fixed height to be scanned. The scanner can obtain a good quality of the scanned image and avoid the diffusion problem caused by variant heights of slides. The groove shape can also be U, \cap or the like for securing and mounting slides at a fixed height, wherein the slides may have different thicknesses.

The aperture 33 further includes a picking portion, which is located on fourth side 334 of the aperture 33. The user can pick up the slide 5 through the picking portion 44. First, the user pushes the slide 5 to the third side 333 of the aperture 33. The third edge 523 of the slide 5 presses and biases the second securing clip 42. Thus, the fourth edge 524 of the slide 5 can leave the first securing groove 43. The user therefor is able to easily remove the slide 5.

The aperture 33 would yet comprise a first support member 46 and a second support member 47. The first support member 46 extends from the bottom of the first side 331 of the aperture 33. The second support member 47 extends from the bottom of the second side 332 of the aperture 33. The slide 5

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is fully supported in the securing cell 31 by the first support member 46 and the second support member 47.

In view of the convenient usage of the frame 32, the frame 32 can be manufactured the same size as the document glass 73 of the scanner 7. As shown in FIG. 7, the user can easily place the frame 32 on the document glass 73 of the scanner 7. In this concern, the misplacement of the frame 32 would be avoided and the scanner would scan right positions of the slides. Moreover, the securing device can be molded as one piece to reduce the cost and processes of manufacture. By this way, the cost is down and the manufacturing steps are simplified to benefit the competition on the market.

Although preferred embodiments of the present invention have been described in the forgoing description and illustrated in the accompanying drawings, it will be understood that the invention is not limited to the embodiments disclosed, but is capable of numerous rearrangements, modifications, and substituting of parts and elements without departing from the spirit and scope of the invention. Accordingly, the present invention is intended to encompass such rearrangements, modifications, and substitutions of parts and elements as fall within the scope of the appended claims.

What is claimed is:

1. An apparatus for securing a slide, comprising:

a frame[,] configured to be placed on a document glass of a scanner; and

a securing cell[,] formed in [said] the frame, the securing cell comprising[.]:

an aperture having a larger size than the size of a slide[.];

a first securing clip[,] located on a first side of [said] the aperture[, providing] and configured to provide force to push a first edge of [said] the slide and [enforcing] forcing a second edge of [said] the slide [attaching] against a second side of [said] the aperture, wherein [said] the second side of [said] the aperture is opposite to [said] the first side and [said] the second edge of [said] the slide is opposite [said] the first edge of [said] the slide[.];

a second securing clip, located on a third side of [said] the aperture, providing force to push a third edge of [said] the slide and [enforcing] forcing a fourth edge of [said] the slide [attaching] against a fourth side of [said] the aperture, wherein [said] the fourth second side of [said] the aperture is opposite to [said] the third side and [said] the fourth edge of [said] the slide is opposite [said] the third edge of [said] the slide[.]; and

a first securing groove[,] located on [said] the fourth side of [said] the aperture[, securing said] and configured to secure the fourth edge of [said] the slide on [said] the first securing groove during [said] the second securing clip [enforcing said] pushing the third edge of [said] the slide, [in order] wherein the securing cell is configured to prevent the movement of the slide and maintain a fixed height in [said] the securing cell.

2. The apparatus of claim 1, wherein the size of [said] the frame is same as the size of [said] the document glass.

3. The apparatus of claim 1, wherein [said] the aperture comprises a picking portion, located on the fourth side of [said] the aperture, for picking [said] the slide.

4. The apparatus of claim 1, further comprising:

a first support member, extending from the bottom of [said] the first side of [said] the aperture[, for supporting said] and configured to support the slide in [said] the securing cell; and

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a second support member[,] extending from the bottom of [said] the second side of [said] the aperture[, for supporting said] and configured to support the slide in [said] the securing cell.

5. The apparatus of claim 1, wherein [said] the first securing groove is V shaped.

6. The apparatus of claim 1, wherein [said] the first securing groove is U shaped.

7. The apparatus of claim 1, wherein [said] the frame and [said] the securing cell are molded in one piece.

8. The apparatus of claim 1, wherein [said] the second securing clip comprises:

a second securing groove[, which is] formed on the same plane of [said] the first securing groove, [securing said] the second securing groove being configured to secure the third edge of side slide on [said] the second securing groove when [said] the second securing clip enforces [said] the third edge of [said] the slide, [in order] wherein the securing cell is configured to prevent the movement of [said] the slide in [said] the securing cell and maintain [said] the slide at [said] the fixed height.

9. The apparatus of claim 1, wherein [said] the first securing groove is V [shape] shaped.

10. The apparatus of claim 1, wherein [said] the first securing groove is \cap [shape] shaped.

11. An apparatus, comprising:

a frame configured to be placed on a document glass of a scanner; and

a cell formed in the frame and having an aperture formed in the cell, the cell comprising:

a clip disposed on a first side of the cell and configured to provide force to a first edge of a slide to push a second edge of the slide against a second side of the cell; and

a groove disposed on at least one of the clip, the second side of the cell, or another side of the cell, or combinations thereof, the groove being configured to limit movement of the slide.

12. The apparatus of claim 11 wherein the frame has a size approximately equal to a size of the document glass.

13. The apparatus of claim 11 wherein the cell further comprises a picking portion located on at least one side of the cell, the picking portion being configured to allow the slide to be removed from the cell.

14. The apparatus of claim 11 wherein the cell further comprises:

at least one support member extending from at least one side of the frame at one or more sides of the cell, wherein the at least one support member is configured to at least partially support the slide in the cell.

15. The apparatus of claim 11 wherein the groove is generally V shaped in at least one cross section.

16. The apparatus of claim 11 wherein the groove is generally U shaped in at least one cross section.

17. The apparatus of claim 11 wherein the frame and the cell comprise a unitary structure.

18. The apparatus of claim 11, further comprising:

a second clip disposed on another side of the cell, the second clip being configured to provide force to one edge of the slide to push an opposite edge of the slide against one side of the cell.

19. The apparatus of claim 11 wherein the groove comprises a first groove, and wherein the apparatus further comprises:

a second groove disposed on at least one of the clip, the second side of the cell, or another side of the cell, or

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combinations thereof, the second groove being configured to limit movement of the slide.

20. The apparatus of claim 11 wherein the groove is generally \cap shaped in cross section.

21. A system, comprising:

a scanner;

a document glass disposed on the scanner, wherein the document glass is configured to allow a document to be scanned; and

a frame configured to be placed on the document glass of a scanner, the frame having a cell formed in the frame and an aperture formed in the cell, the cell comprising:

a clip disposed on a first side of the cell, the clip being configured to provide force to a first edge of a slide to push a second edge of the slide against a second side of the cell; and

a groove disposed on at least one of the clip, the second side of the cell, or another side of the cell, or combinations thereof, the groove being configured to limit movement of the slide.

22. The system of claim 21 wherein the frame has a size approximately equal to a size of the document glass.

23. The system of claim 21 wherein the cell further comprises a picking portion located on at least one side of the cell, the picking portion being configured to allow the slide to be removed from the cell.

24. The system of claim 21, the securing cell further comprising:

at least one support member extending from at least one side of the frame on one or more sides of the cell, wherein the at least one support member is configured to at least partially support the slide in the cell.

25. The system of claim 21 wherein the groove is generally V shaped in at least one cross section.

26. The system of claim 21 wherein the groove is generally U shaped in at least one cross section.

27. The system of claim 21 wherein the frame and the cell comprise a unitary structure.

28. The system of claim 21, further comprising:

a second securing clip disposed on another side of the cell, the second clip being configured to provide force to one edge of the slide to push an opposite edge of the slide against one side of the cell.

29. The system of claim 21 wherein the groove comprises a first groove, and wherein the system further comprises:

a second groove, disposed on at least one of the clip, the second side of the cell, or another side of the cell, or combinations thereof, the second groove being configured to limit movement of the slide.

30. The system of claim 21 wherein the groove is generally \cap shaped in cross section.

31. An apparatus, comprising:

means for locating one or more slides in a predetermined alignment on a document glass of a scanner; and

means for securing at least one slide of the one or more slides in the means for locating, the means for securing comprising:

means for providing a force to one edge of the slide to push a second edge of the slide against the means for securing; and

means for limiting movement of the slide within the means for securing, the means for limiting being disposed on at least one of the means for providing or the means for securing, or combinations thereof.

32. The apparatus of claim 31 wherein the means for locating have a size approximately equal to a size of the document glass.

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33. The apparatus of claim 31 wherein the means for securing further comprises means for allowing the slide to be removed from the means for securing.

34. The apparatus of claim 31 wherein the means for securing further comprises means for supporting the slide in the means for securing.

35. The apparatus of claim 31 wherein the means for limiting is generally V shaped in at least one cross section.

36. The apparatus of claim 31 wherein the means for limiting is generally U shaped in at least one cross section.

37. The apparatus of claim 31 wherein the means for locating and the means for securing comprise a unitary structure.

38. The apparatus of claim 31 wherein the means for providing a force comprises a first means for providing a force,

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and wherein the apparatus further comprises a second means for providing a force to another edge of the slide to push an opposite edge of the slide against the means for securing.

39. The apparatus of claim 31 wherein the means for limiting comprises a first means for limiting, and wherein the apparatus further comprises a second means for limiting a movement of the slide within the means for securing, the second means for limiting being disposed on at least one of the means for providing or the means for securing, or combinations thereof.

40. The apparatus of claim 31 wherein the means for limiting is generally \cap shaped in cross section.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : RE42,823 E
APPLICATION NO. : 11/332808
DATED : October 11, 2011
INVENTOR(S) : Tsai et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page:

Item [64], Replace sub-heading, PCT Filed: with sub-heading, Filed.

Signed and Sealed this
First Day of November, 2011

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive style with a large initial 'D' and 'K'.

David J. Kappos
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : RE42,823 E
APPLICATION NO. : 11/332808
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Page 1 of 1

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On the Title Page:

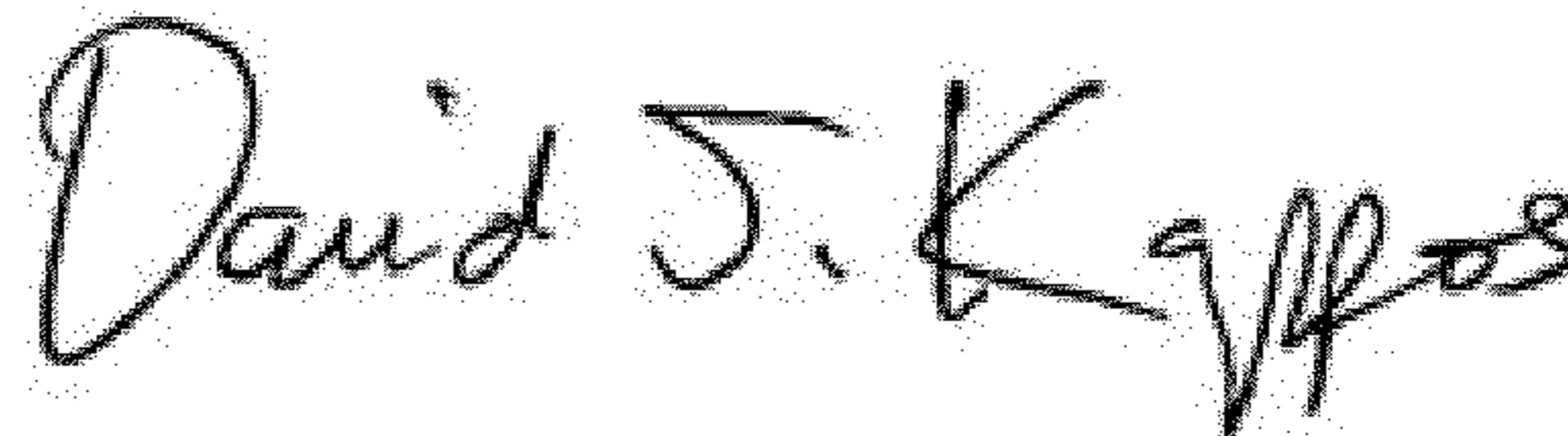
Item (54) and at Column 1, line 2, Title, delete "SYSEM" and insert -- SYSTEM --.

On the Title Page:

Item [64], Replace sub-heading, PCT Filed: with sub-heading, Filed.

This certificate supersedes the Certificate of Correction issued November 1, 2011.

Signed and Sealed this
First Day of May, 2012

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, slightly slanted style.

David J. Kappos
Director of the United States Patent and Trademark Office