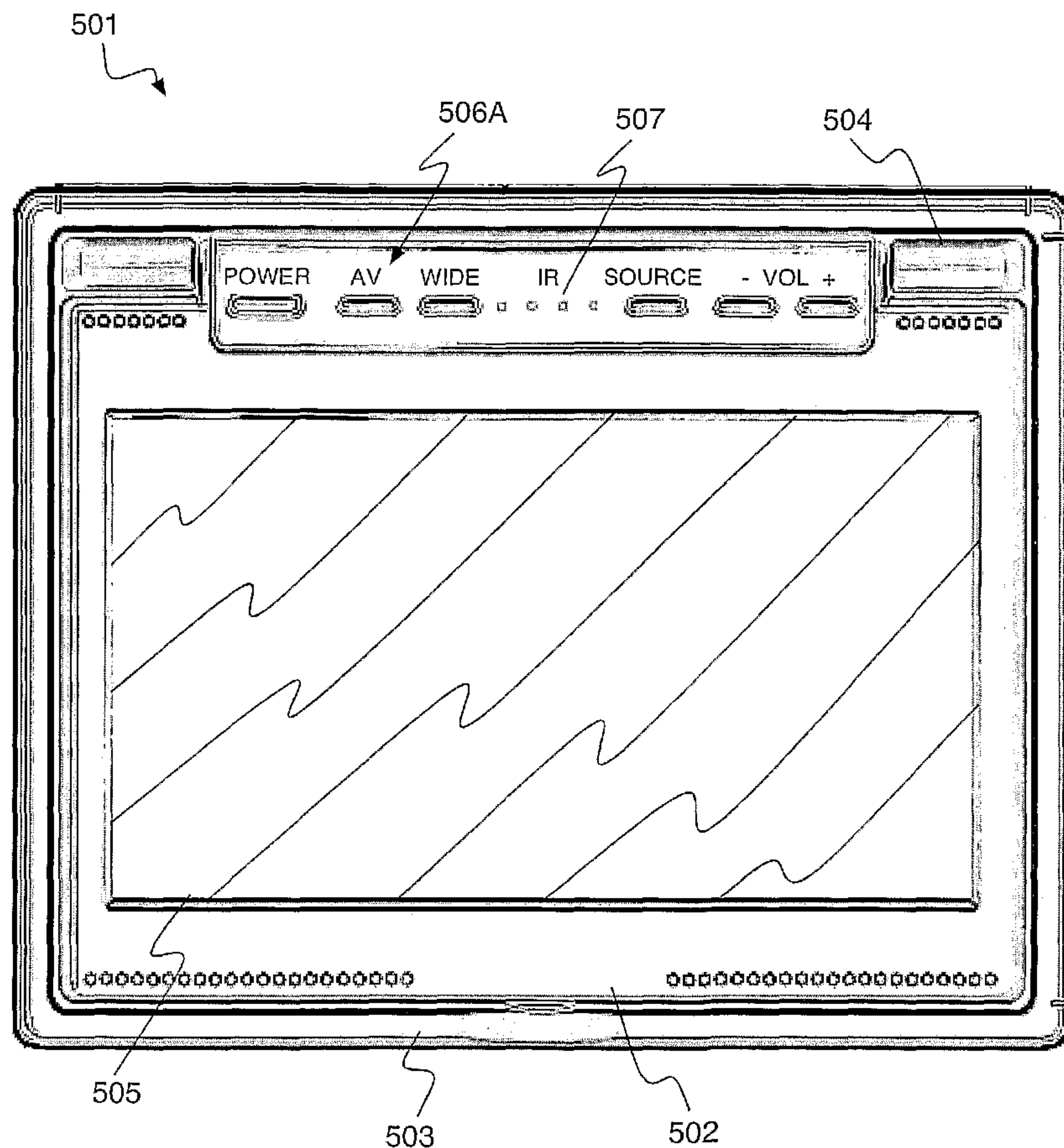




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(54) Titre : SYSTEME VIDEO POUVANT ETRE MONTE DANS UN APPUI-TETE
 (54) Title: HEADREST MOUNTABLE VIDEO SYSTEM



(57) Abrégé/Abstract:

A video system comprises a base unit coupled to an internal headrest support structure, wherein the base unit comprises a media player, and a display mounted in a door pivotally connected to the base unit by a hinge and concealing the media player in a closed position.



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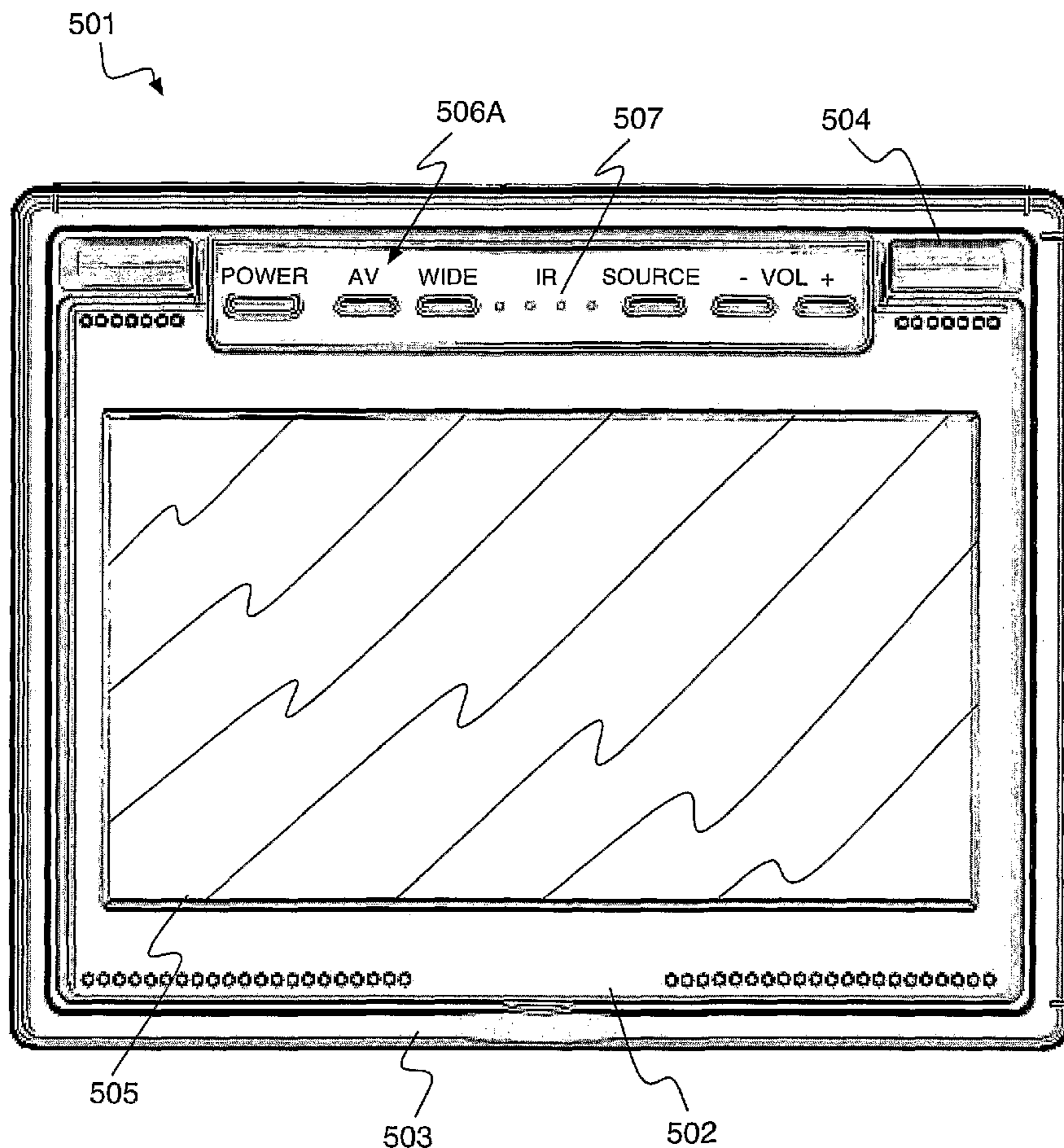
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[Continued on next page]

(54) Title: HEADREST MOUNTABLE VIDEO SYSTEM



(57) Abstract: A video system comprises a base unit coupled to an internal headrest support structure, wherein the base unit comprises a mediaplayer, and a display mounted in a door pivotally connected to the base unit by a hinge and concealing the media player in a closed position.

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HEADREST MOUNTABLE VIDEO SYSTEM**BACKGROUND OF THE INVENTION****1. Field of the Invention:**

The present invention relates to a video system, and more particularly to a video system capable
5 of being mounted in a headrest.

2. Discussion of Related Art:

As society becomes more mobile and therefore spends a greater amount of time traveling and
away from home, demand rises for electronic appliances and devices outside the home environment.
For example, as shown in Figures 1 and 2, video screens 101 have been mounted in the headrests 102 of
10 vehicles, facilitating video entertainment on the road. These video screens are connected to video
players located, for example, in the glove box of the vehicle. However, the video player and video screen
cannot be removed from the vehicle. Thus, videos may only be viewed with such systems when
occupying the vehicle, and only from particular vantage points within the vehicle. Further, there is also a
risk of theft of the video screen and video player and corresponding damage to the vehicle when the
15 vehicle is unattended.

Therefore, a need exists for a video system capable of being mounted in a headrest.

SUMMARY OF THE INVENTION

According to an embodiment of the present invention, a video system comprises a base unit
coupled to a headrest support structure located within a headrest of a vehicle seat, wherein the base
20 unit comprises a media player; and a display mounted in a door pivotally connected to the base unit by a
hinge and in a closed position concealing the media player, wherein the closed position is also a viewing
position of the display. The video system further comprises a docking station disposed between the base
unit and the headrest support structure, for selectively coupling the video system to the headrest
support structure, wherein the video system can be selectively un-coupled from the base unit; and at
25 least a portion of the docking station is disposed within the headrest and is directly coupled to the
headrest support structure. Additional aspects of the video system may include that it is a clamshell-
type device, the hinge is a swivel-hinge, that it further comprises a wireless transmitter positioned on
the door and that it includes a port for connecting to an external device. The video system may comprise

a power source coupled to the docking station, the docking station providing power to a coupled video system. The video system is coupled to an external device through the docking station, wherein the docking station and the video system are coupled by a pin array.

According to a further embodiment of the invention, a video system comprises a base unit
5 coupled to an internal headrest support structure; and a door pivotally connected to the base unit by a hinge, the door comprising a display and a media player, wherein the media player comprises at least one of a DVD player, an MPEG player or a video game player, and is positioned on the door behind the display. The video system of the further embodiment may further comprise a docking station disposed between the base unit and the internal headrest support structure, for selectively coupling the video
10 system to the internal headrest support structure, wherein the video system can be selectively uncoupled from the base unit. Additional aspects of the video system of the further embodiment may include that it is a slot-type device, that it comprises a wireless transmitter, that the hinge is a swivel-hinge, that it also comprises a port for connecting to an external device, that it comprises a slot for receiving a data media is positioned on a side of the door. The video system of the further embodiment
15 may also comprise a power source coupled to the docking station, the docking station providing power to a coupled video system. The video system of the further embodiment is coupled to an external device through the docking station, wherein the docking station and the video system are coupled by a pin array. A cover may be secured to the docking station in the absence of the portable video system.

According to yet another embodiment of the invention, a docking station is adapted to secure a
20 portable video system comprising a means for securing the docking station to a headrest support structure located within a headrest of a vehicle seat, wherein at least a portion of the docking station is disposed within the headrest; a means for securing the portable video system to the docking station; and a pin array for providing power to a secured portable video system, wherein the pin array is disposed on a wall of the docking station and mates with a corresponding pin array on the portable
25 video system. The pin array carries a signal between the secured removable video unit and an external device. The signal may be one of an audio signal and a video signal.

According to an additional embodiment of the invention, a video system comprises a display mounted to a headrest of a vehicle seat, wherein the display is pivotally coupled to a headrest support element; and a media player comprising at least one of a DVD player, an MPEG player or a video game
30 player, wherein the media player is positioned behind the display, so that the media player pivots with the display.

According to another embodiment a video system comprises a base portion positioned in a headrest of a vehicle seat, wherein the base portion accommodates a media player and a display pivotally connected to the base portion and in a closed position concealing the media player, wherein the closed position is also a viewing position of the display.

5 According to yet another embodiment a docking station is adapted to secure a portable video system and comprises a means for securing the docking station to a headrest support structure; a means for securing the portable video system to the docking station; and a pin array for providing power to a secured portable video system, wherein the pin array is disposed on a wall of the docking station and mates with a corresponding pin array on the portable video system

10 **BRIEF DESCRIPTION OF THE DRAWINGS**

Preferred embodiments of the present invention will be described below in more detail, with reference to the accompanying drawings:

Figure 1 is an illustration of a video screen installed in a vehicle headrest;

Figure 2 is an illustration of a video screen installed in a vehicle headrest;

15 Figure 3A is an illustration of a side view of a video system and docking station according to an embodiment of the present invention;

Figure 3B is an illustration of a side view of a video system and docking station according to an embodiment of the present invention;

20 Figure 3C is an illustration of a side view of an undocking stationed video system according to an embodiment of the present invention;

Figure 3D is an illustration of a side view of a video system according to an embodiment of the present invention

Figures 4A and 4B are illustrations of a docking station according to an embodiment of the present invention;

Figure 5A is an illustration of a front view of a clamshell-type video system according to an embodiment of the present invention;

5 Figure 5B is an illustration of a top view of a clamshell-type video system according to an embodiment of the present invention;

Figure 5C is an illustration of a side view of a clamshell-type video system according to an embodiment of the present invention;

10 Figure 5D is an illustration of a front view of a clamshell-type video system in an open position according to an embodiment of the present invention;

Figure 6A is an illustration of a docking station according to an embodiment of the present invention;

Figure 6B is an illustration of a rear view of a video system according to an embodiment of the present invention;

15 Figures 7A and 7B are illustrations of mechanisms for coupling a video system and a docking station according to an embodiment of the present invention;

Figure 8 is an illustration of a video system according to an embodiment of the present invention;

20 Figure 9 is an illustration of a docking station cover according to an embodiment of the present invention;

Figure 10 is a diagram of a system according to an embodiment of the present invention;

Figures 11A and 11B are illustrations of a video system according to an embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

According to an embodiment of the present invention, a portable video system can be coupled to a vehicle headrest. The portable video system receives a data media comprising data to be displayed. The video system is secured to a docking station mounted in the headrest. The video system is removable, such that the video system can be disconnected from the docking station.

Referring to Figure 3A, the portable video system can be embodied as a slot-type video system 301 comprising a slot 302 that receives a data media into a mechanism for accessing data stored on the medium, such as a digital videodisk (DVD) player, MPEG layer 3 (MP3) disk, or video game disk. The video system 301 is secured to a docking station 303. The video system 301 comprises a hinge 304. The hinge connects a video screen portion of the video system to a base portion of the video system.

As shown in Figure 3B, the docking station 303 is secured in the headrest 102, and more particularly to an internal headrest support structure 305. The docking station 303 can be secured by, for example, a catch 401 as shown in Figure 4A and/or a screw 402 as shown in Figure 4B. One of ordinary skill in the art would recognize that other means of securing the docking station can be used, for example, an adhesive compound. The docking station 303 secures a base portion of the video system 301, and allows a video screen portion 306 to pivot away from the base portion. In a slot-type device, as shown in Figure 3B, the slot 302 is exposed for receiving a data media when the video screen portion 306 is in a pivoted position away from the base portion of the video system 301.

As shown in Figure 3C, the video system 301 can be disconnected from the docking station 303 (cut away view). The video system 301 can be operated autonomously. That is, when decoupled from the docking station 303, the video system 301 can access a data media to play, for example, a movie. When disconnected from the docking station, the video

system can operate on power supplied by an optional battery or a connection to an external power supply, such as an AC or DC current. The connection can be to the base portion 307 of the video system 301.

Referring to Figure 3D, a headrest 308 can comprise an opening 309 for receiving a data media into the video system 301. The video system 301 can be a permanently installed or portable video system. The headrest opening 309 aligns with the slot 302 (not shown) of the video system 301 to allow data media, such as a DVD or MP3 disk to be inserted from the side, top, or bottom of the headrest 308. The headrest 308 further comprises vents 310 for dissipating heat. A cooling fan 311 for increasing airflow can also be added within the headrest. The cooling fan 311 can be located in the headrest 308 and behind the vent 310, such that the fan is concealed.

Referring to Figures 5A through 5D, a portable video system 501 of a clamshell-type is secured to a docking station. The portable video system 501 comprises a door 502 and a base portion 503 connected by a hinge 504. The door 502 pivots away from the base portion 503 on the hinge 504. The hinge 504 can be positioned on any side of the door 502. The door 502 comprises a video screen 505, controls 506A, and an infrared (IR) transmitter and/or receiver 507. The video system 501 receives a data media 508 comprising data to be accessed. When the door 502 is closed the data media 505 is secured. The door 502 can be opened by, for example, depressing a button releasing the door 503 from the base portion 503 or pulling the door 502 away from the base 503 wherein the hinge 504 is a friction fitting. A media player 509 is concealed by cover 510. The cover 510 can be opened by, for example, depressing a button 511. The video system 501 is removable, such that the video system can be disconnected from the docking station 303.

The base 503 comprises a control panel 506B. The control panel 506B comprises a plurality of controls for controlling the functions of the media player, for example, volume

control, previous, next, pause, eject and play, and a power on/off button. The controls 506A and 506B can be, for example, buttons, switches, a touch sensitive liquid crystal display, and the like.

Referring now to Figures 6A and 6B, the docking station 303 comprises a pin array 601 for connecting to a pin array 602 of a video system 603. The video system 603 can be a slot-type device, a clamshell-type device, or any other device that is capable of being secured in the docking station 303. When the video system 603 is secured to the docking station 303, the pin array 601 and video system pin array 602 transfer data to and from the video player 603. Thus, the video player can be connected to external devices through the docking station 303. The external devices include, for example, a slave video display unit installed in another headrest, a security system, and a vehicle sound system. Where the video system 603 is permanently installed in the headrest, the docking station can be omitted, and a connection to the vehicle's power supply and/or data bus can be directly coupled to the video system 603 through, for example, an electrical harness.

The docking station 303 is coupled to a vehicle's electrical system. The docking station 303 is connected to a vehicle's power supply, e.g., 12 Volts, through a wiring harness. Power can be supplied to the video system 603 through the pin arrays 601 and 602. The docking station 303 can be connected to a vehicle's data communication bus. The data communications bus can carry data to and from the external devices.

Referring to Figure 7A, the docking station 303 comprises a quick release mechanism for securing and releasing the video system 701. The quick release mechanism can include a button 702 for releasing a latch 703, which is secured to the video system 701 by pressing the video system 701 securely into the docking station 303. A latch mechanism comprises a latch 703 that passes into a bottom portion of the video system 701. The latch 703 is momentarily displaced as the video system 701 is coupled with the docking station 303. A

spring 704 secures the latch 703 in the bottom portion of the video system 701. The button 702 can be pressed, aligning the latch 703 with an opening in the bottom portion of the video system 701, and the video system 701 can be pulled away from the docking station 303. As shown in Figure 7B, a rear portion 705 of the video system 701 can be secured by a convex portion 706 that fits within a concave portion 707 in the docking station 303. As the video system 701 is pressed into the docking station 303, a wall of the docking station 708 flexes away from the rear portion of the video player until the convex portion 706 is aligned with the concave portion 707. The convex portion 706 and the concave portion 707 cooperate to secure the video system 701 to the docking station 303. Thus, a wall of the docking station 708 can be formed of, for example, a flexible thermoplastic rubber. Other means of securing the video system 701 to the docking station 303 are contemplated, such as, snaps, locks, latches, and the like.

Referring to Figure 8, the video system 801 comprises input and output ports. For example, audio/video input/output ports 802, a headphone port 803, and a power port 804. It should be understood that other port types can be provided, for example, a USB port or RCA jack for connecting to a game controller. Further, the video system 801 comprises a wireless transmitter for transmitting, for example, an audio radio frequency, Bluetooth®, or Whitefire® signal to wireless headphones. The video system 801 further comprises an infrared (IR) port 805 for transmitting and/or receiving, for example, remote control signals. The ports can be positioned at any convenient location on the video system 801, for example, on a bottom portion of the base of the video system, a front portion of the base of the video system, or a side portion.

When the video system is removed from the docking station 303, a cover 901 can conceal a portion of the docking station, as shown in Figure 9. The cover 901 is manufactured from a material such as, plastic, wood, leather, and/or aluminum. The cover

901 can be secured by the same mechanisms as the video system, such as those shown in Figure 7A and 7B. Thus, the cover 901 and the video player can have one or more features in common, such as openings for receiving latches and the like.

It is to be appreciated that a portable video system according to the present invention is easily removable from and can be operated outside of a vehicle, for example, in home or office environments. Further, the video system can be permanently connected to the headrest support structure by, for example, screws, catches, and adhesives.

Referring now to Figure 10, a video system 1001 and a video slave unit 1002 are connected to a power supply 1003. The video slave unit receives data to be displayed from the video system 1001 through a data bus 1004. The data bus 1004 can be connected to other devices 1005, such as a vehicle's sound system or a vehicle's navigation system. The connections between the video system 1001 and the external device 1005 can be a wireless connection (not shown). Similarly, the connection between the video system 1001 and the video system slave device 1002 can be a wireless connection (not shown).

While the video system has been described in terms of a clamshell-type device and a slot-type device, the video system can be embodied in other configurations, for example, as a draw-type device comprising a draw and a spindle for securing the data media in place. Another example of a video system according to an embodiment of the present invention is a tablet-type device comprising a swivel-hinge connecting a video screen to a base portion as shown in Figures 11A and 11B. The swivel-hinge 1101 allows a door 1102 comprising a screen to move about two axes such that the screen 1102 can be swiveled about the swivel-hinge 1001 while in an open position, pivoted away from the base 1103. The screen can be turned to face the base portion 1103 when in a fully closed position (e.g., Figure 11B) or turned to face away from the base portion 1103 in a closed viewing position (e.g., 11A). In both the closed position and the viewing position, the door 1102 is substantially parallel to

the base portion 1103. The swivel-hinge 1101 can be implemented in a slot-type device or a clamshell-type device.

Having described embodiments for headrest mountable a video system, it is noted that modifications and variations can be made by persons skilled in the art in light of the above teachings. It is therefore to be understood that changes may be made in the particular
5 embodiments of the invention disclosed which are within the scope and spirit of the invention as defined by the appended claims. Having thus described the invention with the details and particularity required by the patent laws, what is claimed and desired protected by Letters Patent is set forth in the appended claims.

10

CLAIMS

1. A video system comprising:
 - a base unit coupled to a headrest support structure located within a headrest of a vehicle seat, wherein the base unit comprises a media player; and
 - a display mounted in a door pivotally connected to the base unit by a hinge and in a closed position concealing the media player, wherein the closed position is also a viewing position of the display.

2. The video system of claim 1, further comprising a docking station disposed between the base unit and the headrest support structure, for selectively coupling the video system to the headrest support structure, wherein:
 - the video system can be selectively un-coupled from the base unit; and
 - at least a portion of the docking station is disposed within the headrest and is directly coupled to the headrest support structure.

3. The video system of claim 1, wherein the video system is a clamshell-type device.

4. The video system of claim 1, wherein the hinge is a swivel-hinge.

5. The video system of claim 1, further comprising a wireless transmitter positioned on the door.

6. The video system of claim 1, further comprising a port for connecting to an external device.

7. The video system of claim 2, further comprising a power source coupled to the docking station, the docking station providing power to a coupled video system.

8. The video system of claim 2, wherein the video system is coupled to an external device through the docking station, wherein the docking station and the video system are coupled by a pin array.

9. A video system comprising:
a base unit coupled to an internal headrest support structure; and
a door pivotally connected to the base unit by a hinge, the door comprising a display and a media player, wherein the media player comprises at least one of a DVD player, an MPEG player or a video game player, and is positioned on the door behind the display.

10. The video system of claim 9, further comprising a docking station disposed between the base unit and the internal headrest support structure, for selectively coupling the video system to the internal headrest support structure, wherein the video system can be selectively un-coupled from the base unit.

11. The video system of claim 9, wherein the video system is a slot-type device.

12. The video system of claim 9, further comprising a wireless transmitter.

13. The video system of claim 9, wherein the hinge is a swivel-hinge.

14. The video system of claim 9, further comprising a port for connecting to an external device.

15. The video system of claim 10, further comprising a power source coupled to the docking station, the docking station providing power to a coupled video system.

16. The video system of claim 10, wherein the video system is coupled to an external device through the docking station, wherein the docking station and the video system are coupled by a pin array.

17. A docking station adapted to secure a portable video system comprising:
a means for securing the docking station to a headrest support structure located within a headrest of a vehicle seat, wherein at least a portion of the docking station is disposed within the headrest;

a means for securing the portable video system to the docking station; and

a pin array for providing power to a secured portable video system, wherein the pin array is disposed on a wall of the docking station and mates with a corresponding pin array on the portable video system.

18. The docking station of claim 17, wherein the pin array carries a signal between the secured removable video unit and an external device.

19. The docking station of claim 18, wherein the signal is one of an audio signal and a video signal.

20. The base unit of claim 9, wherein a cover is secured to the docking station in the absence of the portable video system.

21. The video system of claim 11, wherein a slot for receiving a data media is positioned on a side of the door.

22. A video system comprising:

a display mounted to a headrest of a vehicle seat, wherein the display is pivotally coupled to a headrest support element; and

a media player comprising at least one of a DVD player, an MPEG player or a video game player, wherein the media player is positioned behind the display, so that the media player pivots with the display.

23. A video system comprising:

a base portion positioned in a headrest of a vehicle seat, wherein the base portion accommodates a media player and a display pivotally connected to the base

portion and in a closed position concealing the media player, wherein the closed position is also a viewing position of the display.

24. A docking station adapted to secure a portable video system comprising:
a means for securing the docking station to a headrest support structure;
a means for securing the portable video system to the docking station; and
a pin array for providing power to a secured portable video system, wherein the pin array is disposed on a wall of the docking station and mates with a corresponding pin array on the portable video system.

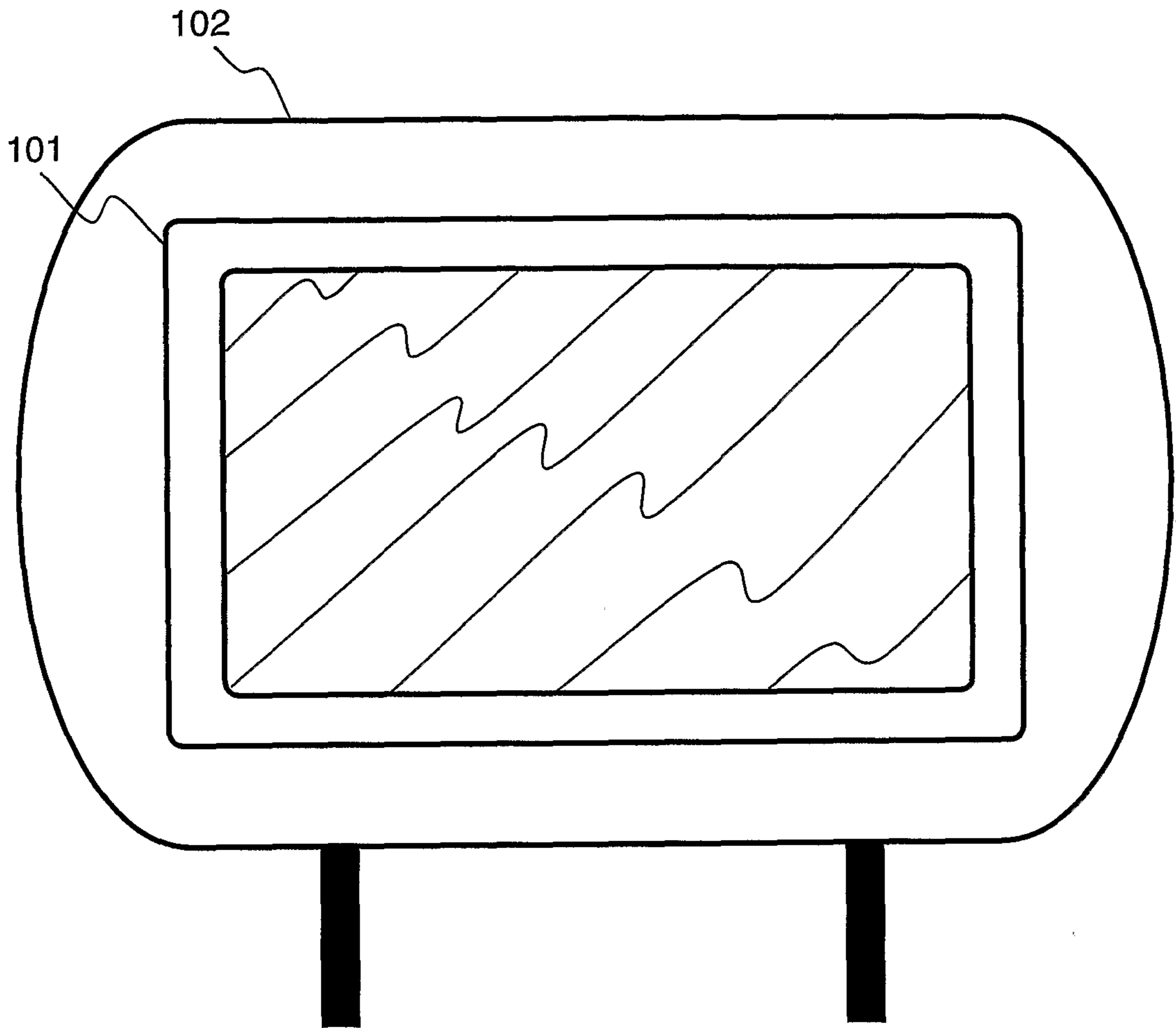


FIGURE 1
(PRIOR ART)

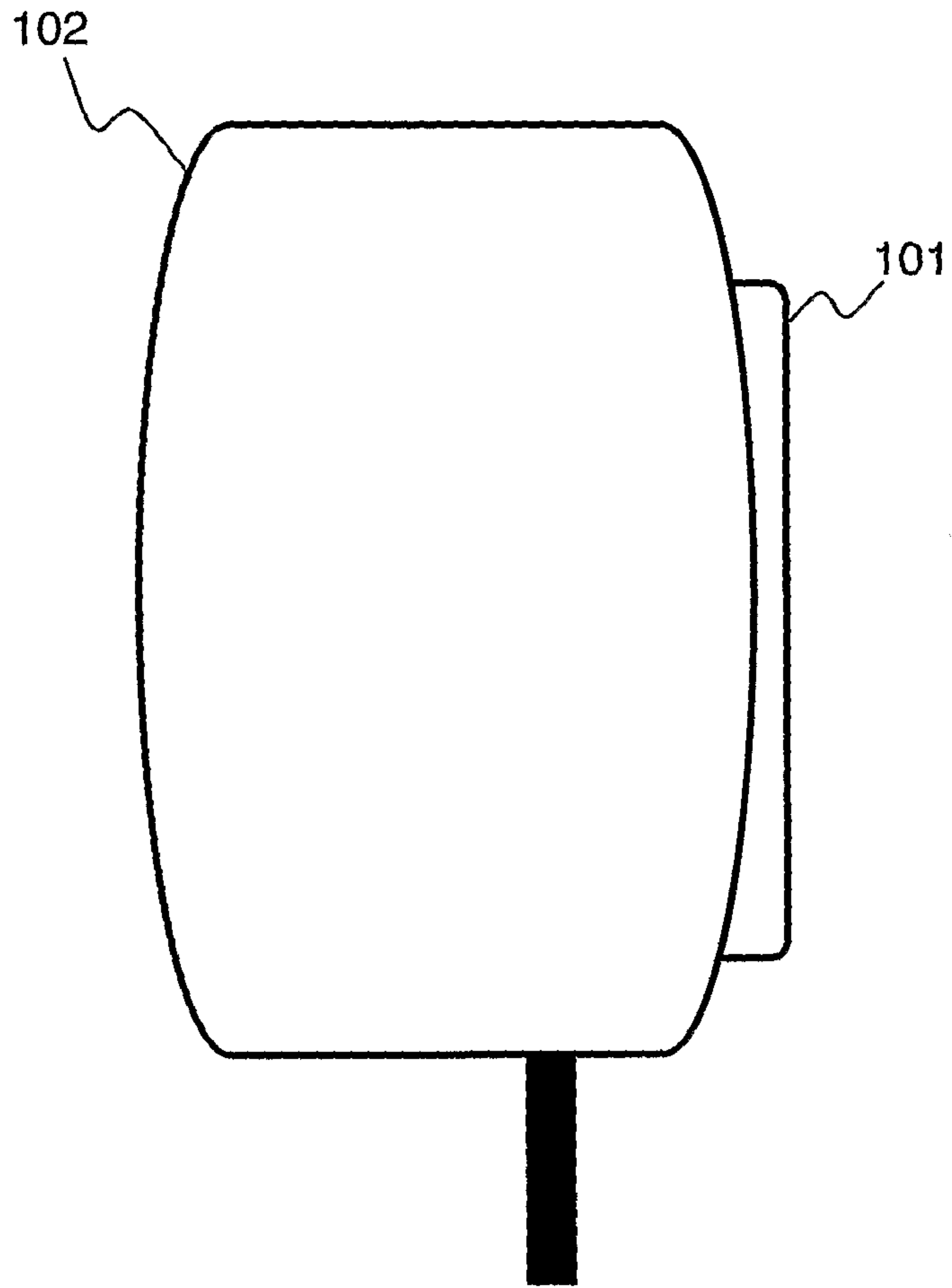


FIGURE 2
(PRIOR ART)

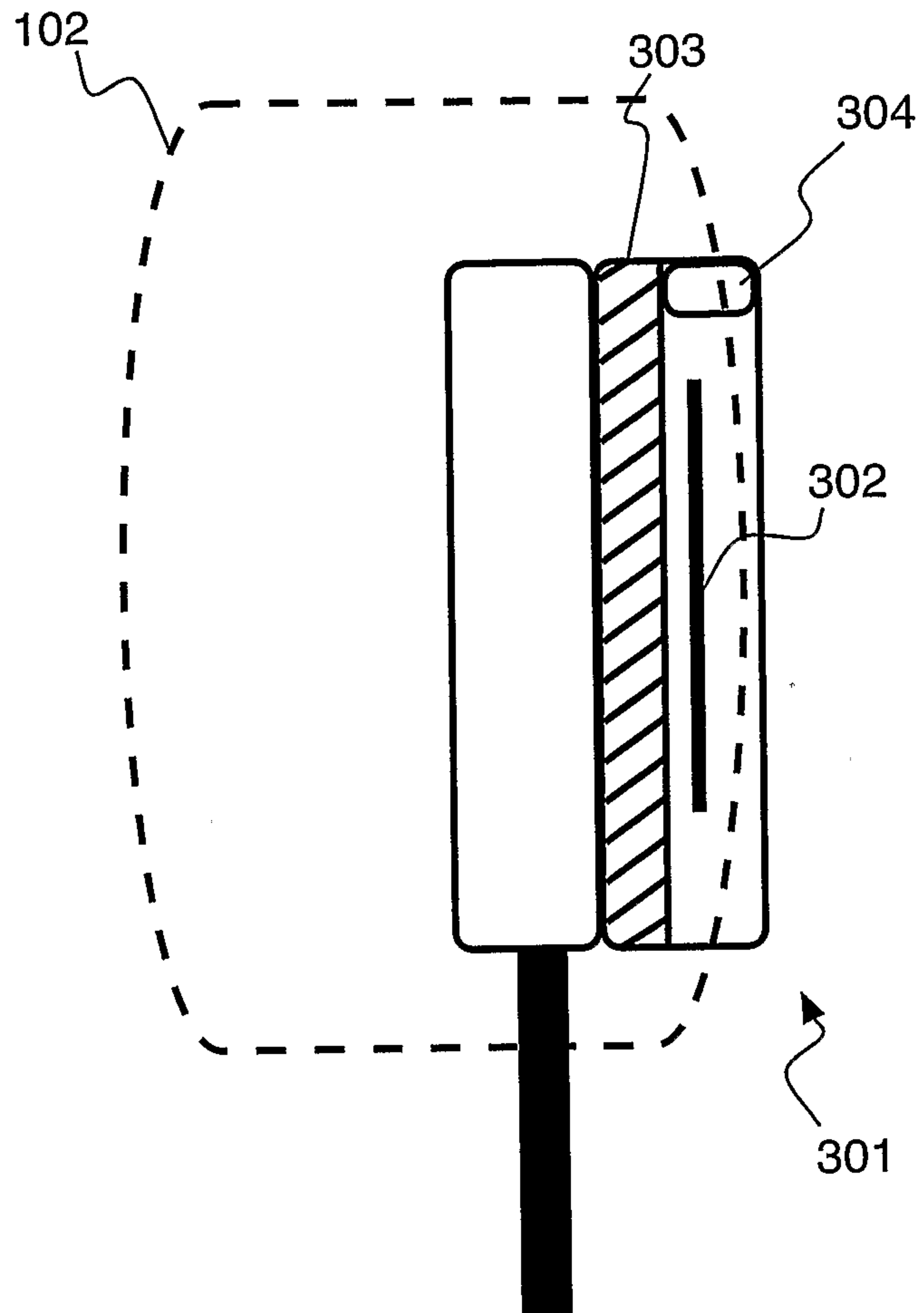


FIGURE 3A

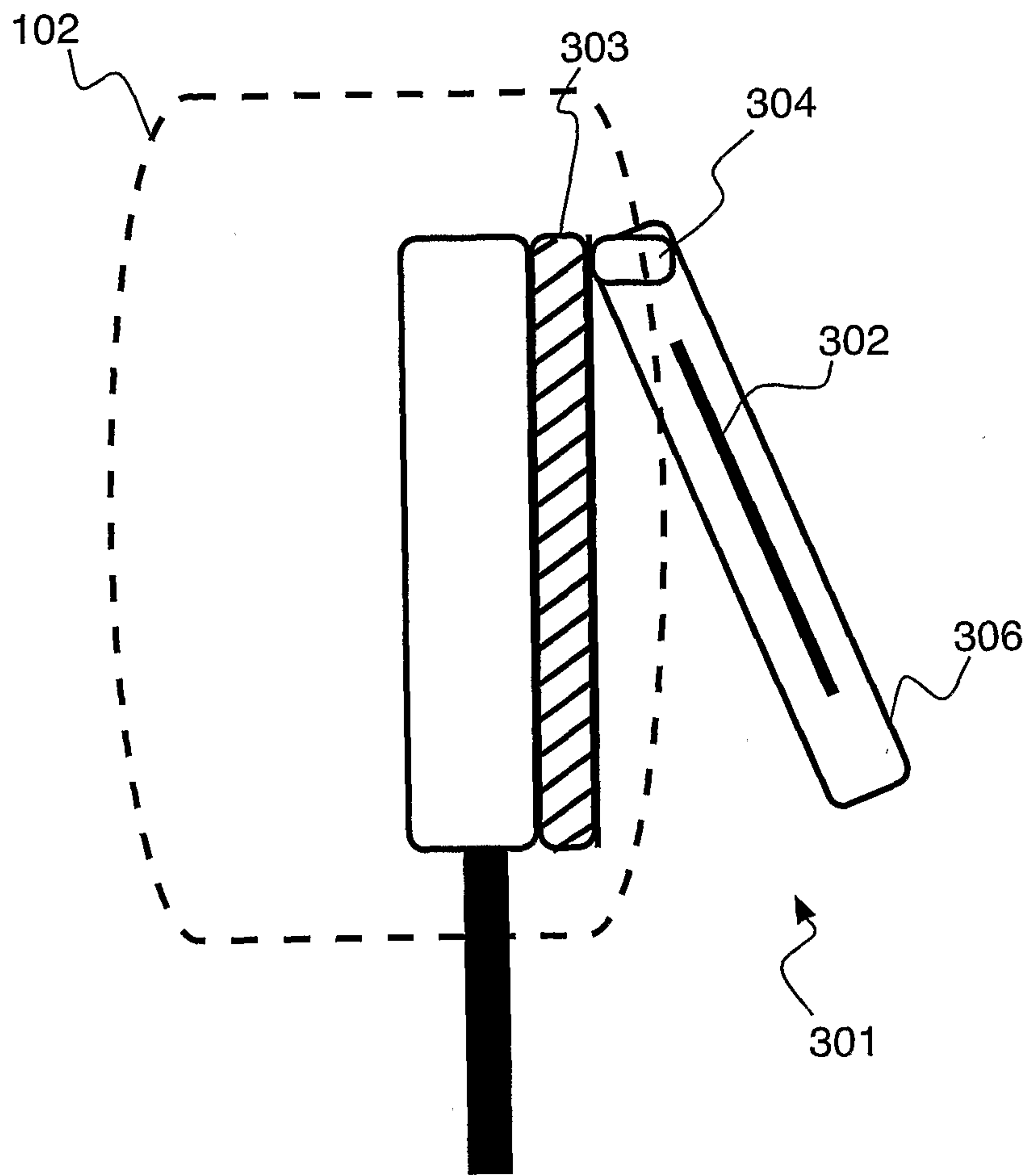


FIGURE 3B

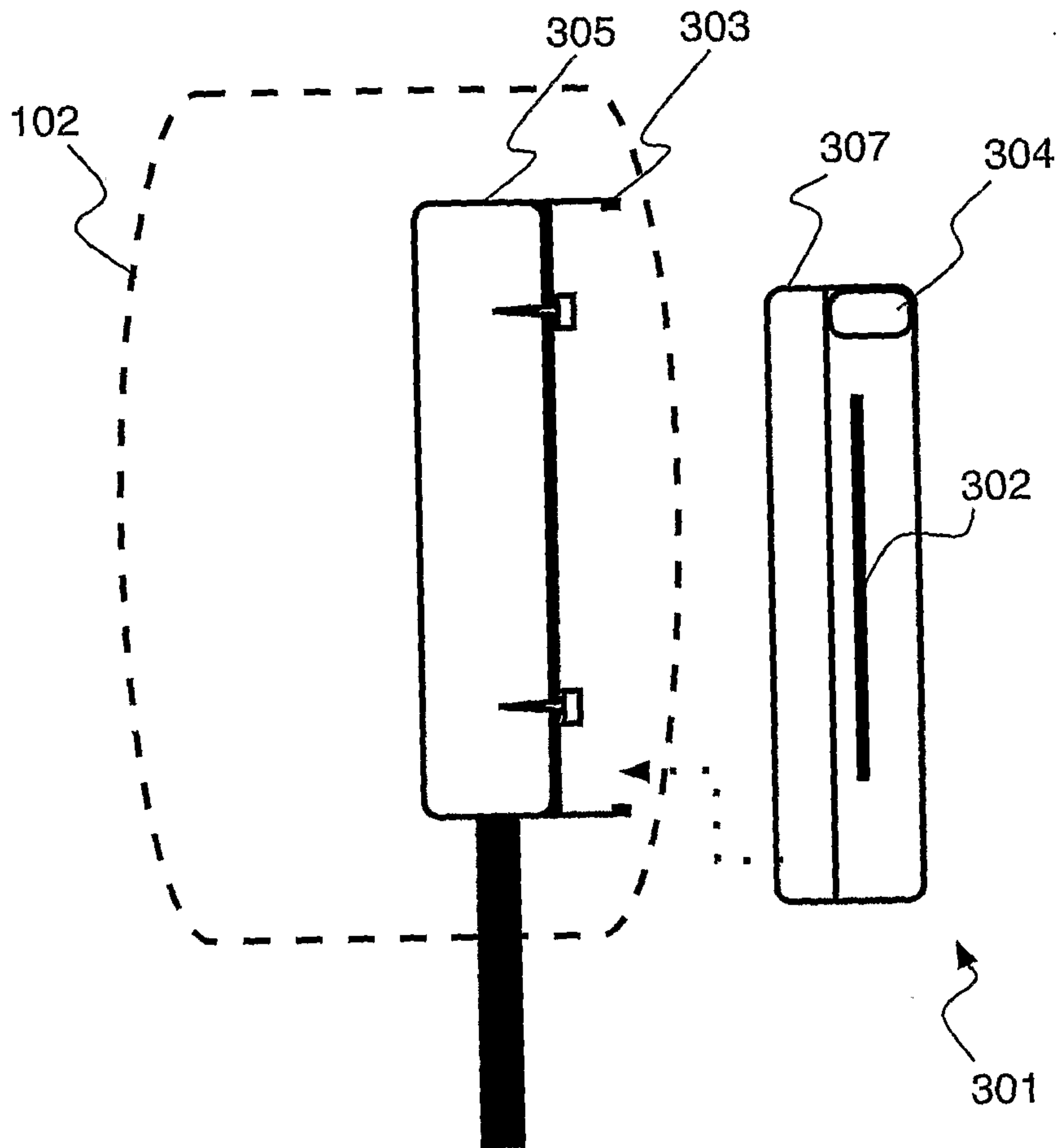


FIGURE 3C

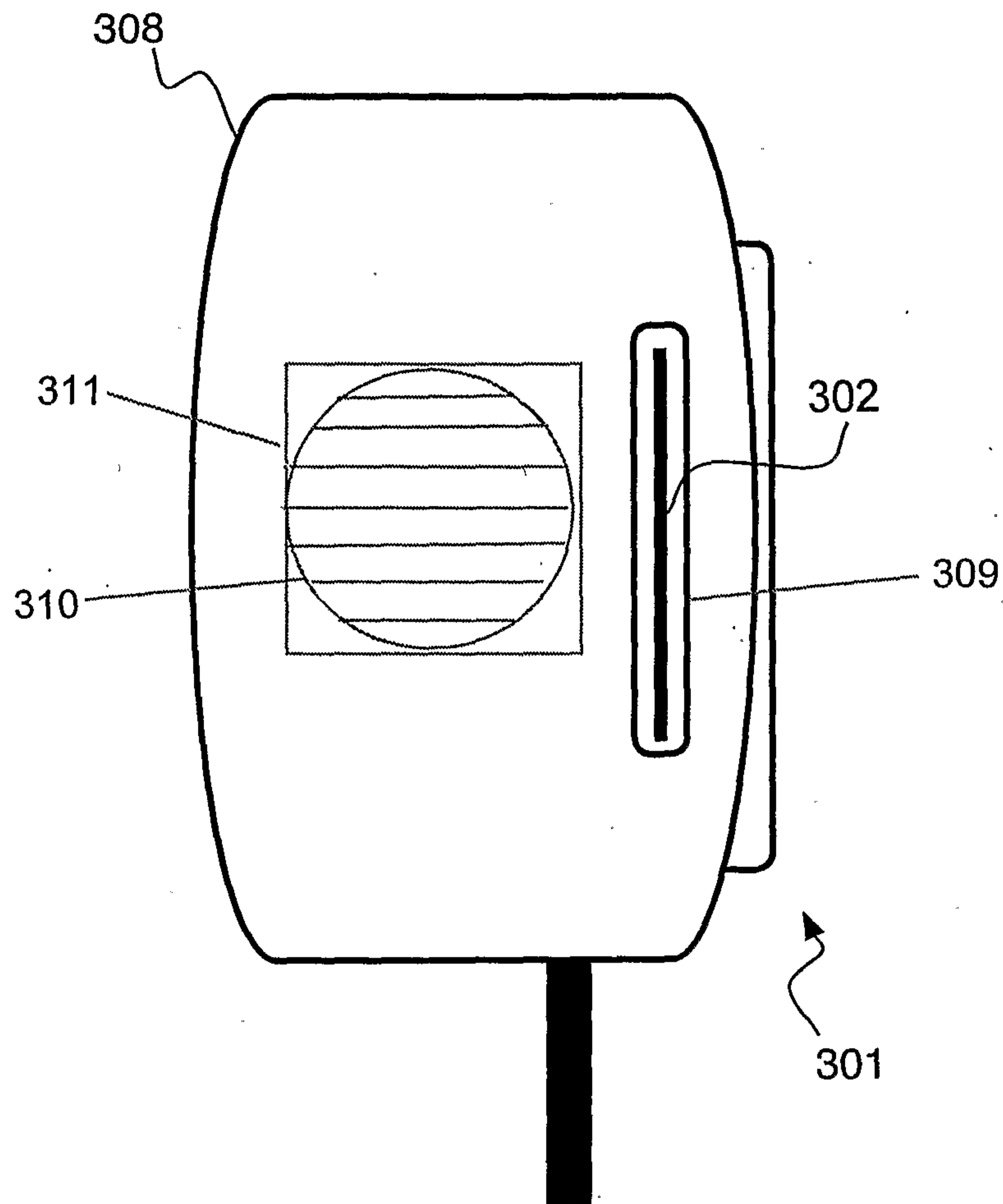


FIGURE 3D

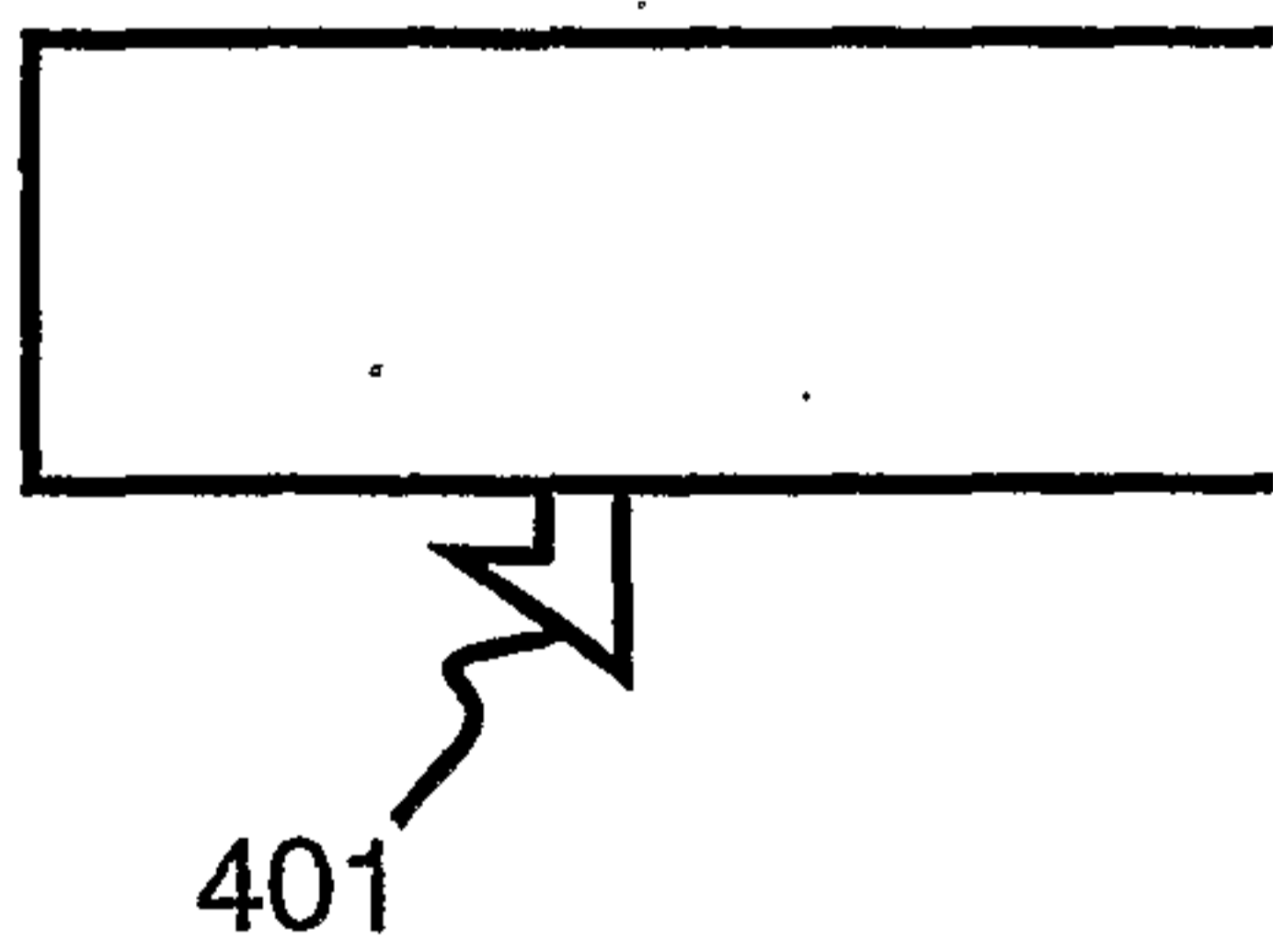


FIGURE 4A

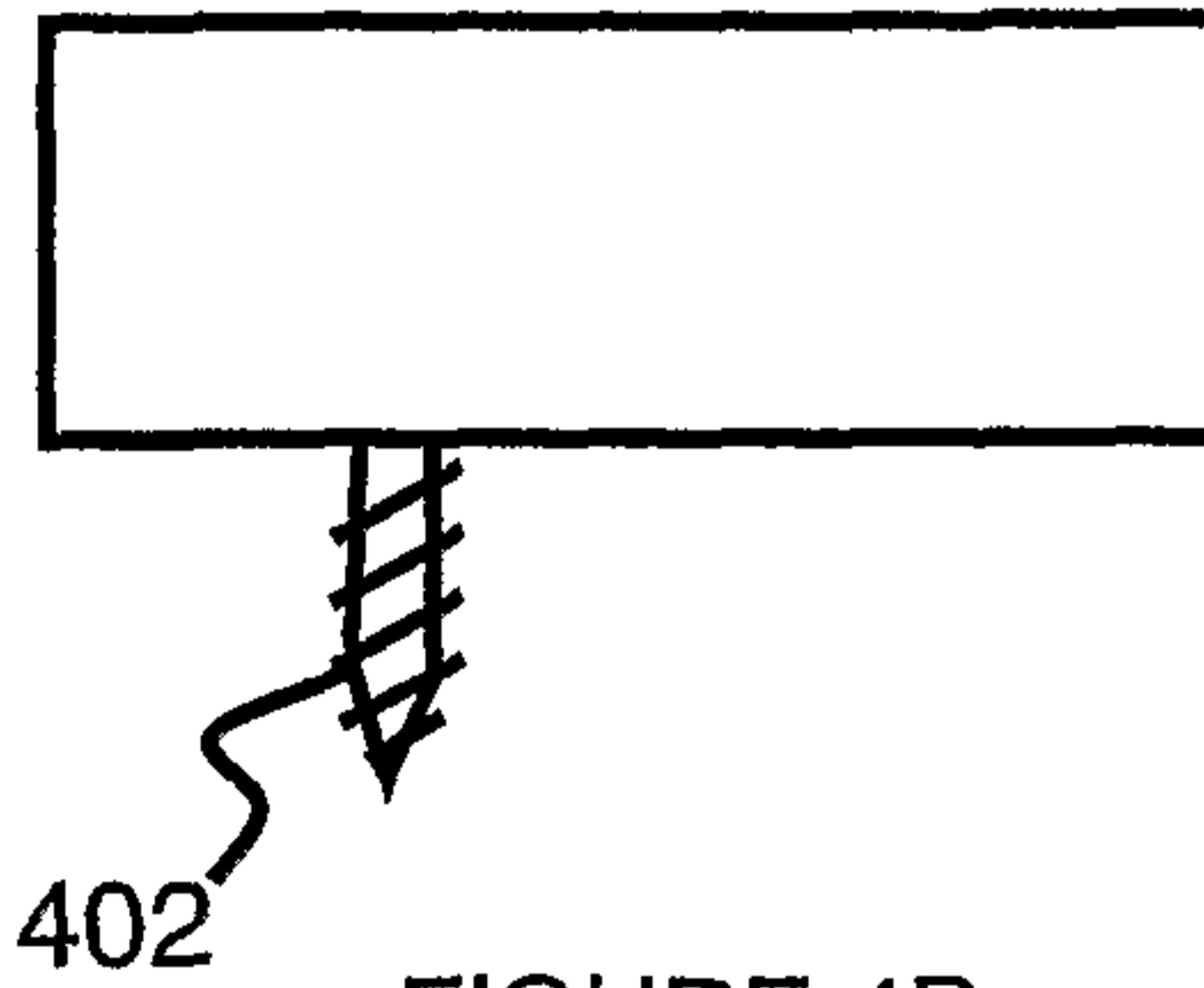


FIGURE 4B

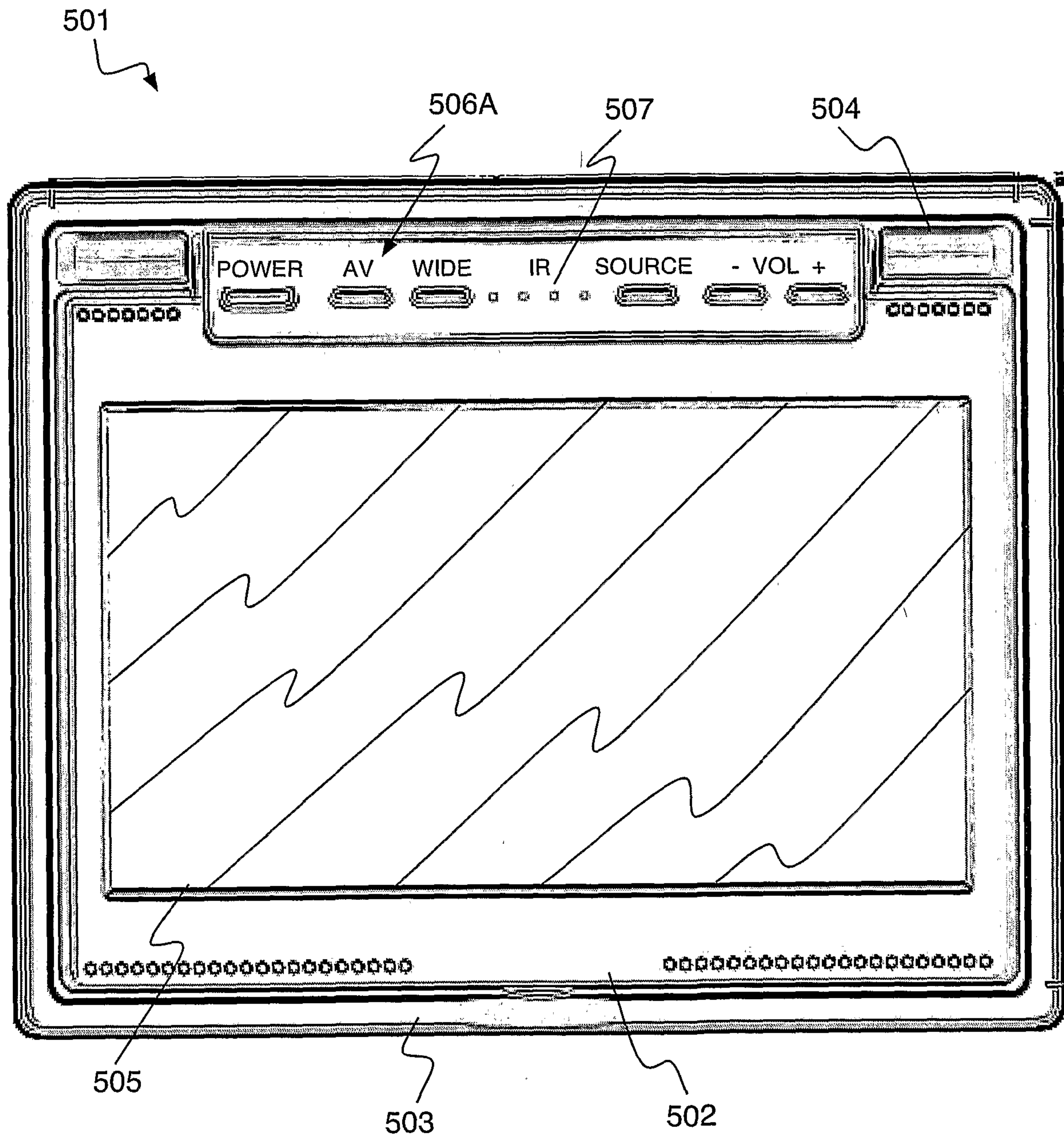


FIGURE 5A

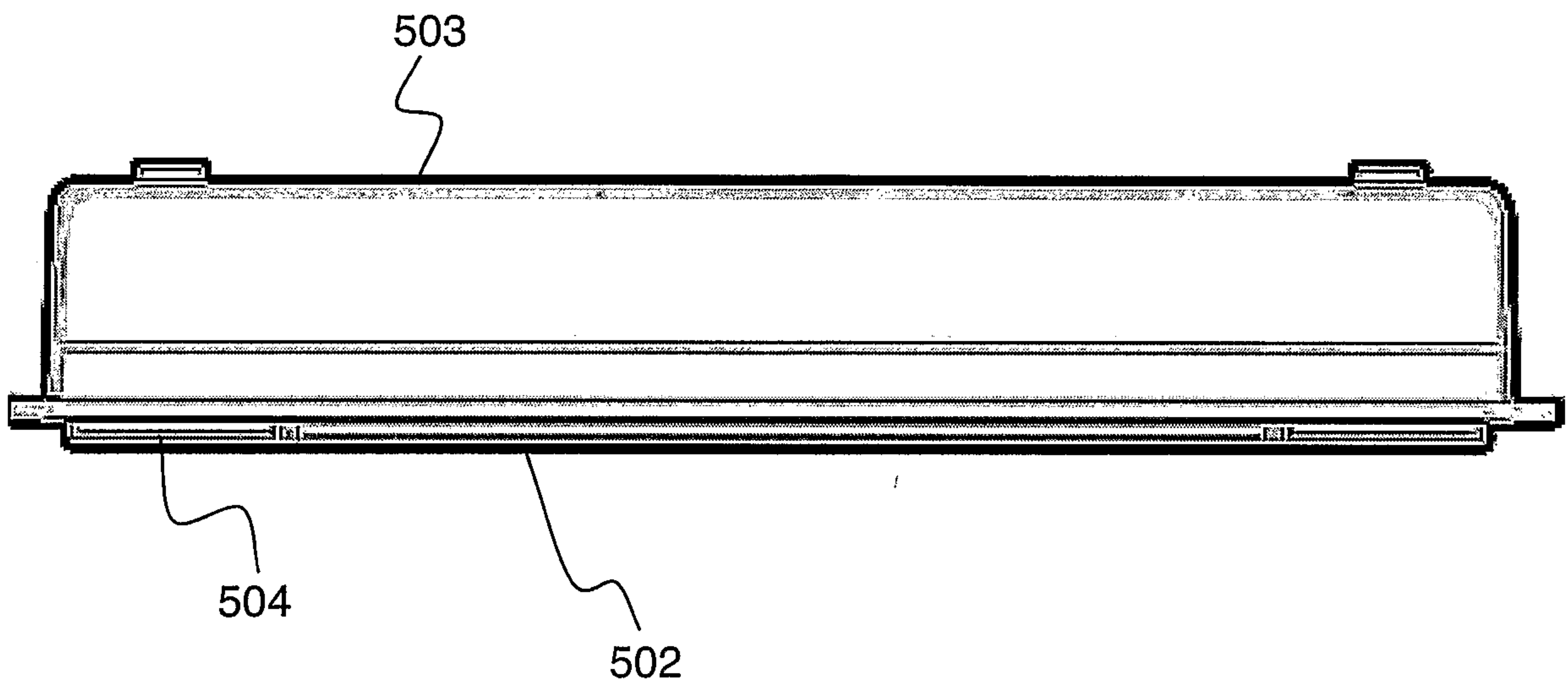


FIGURE 5B

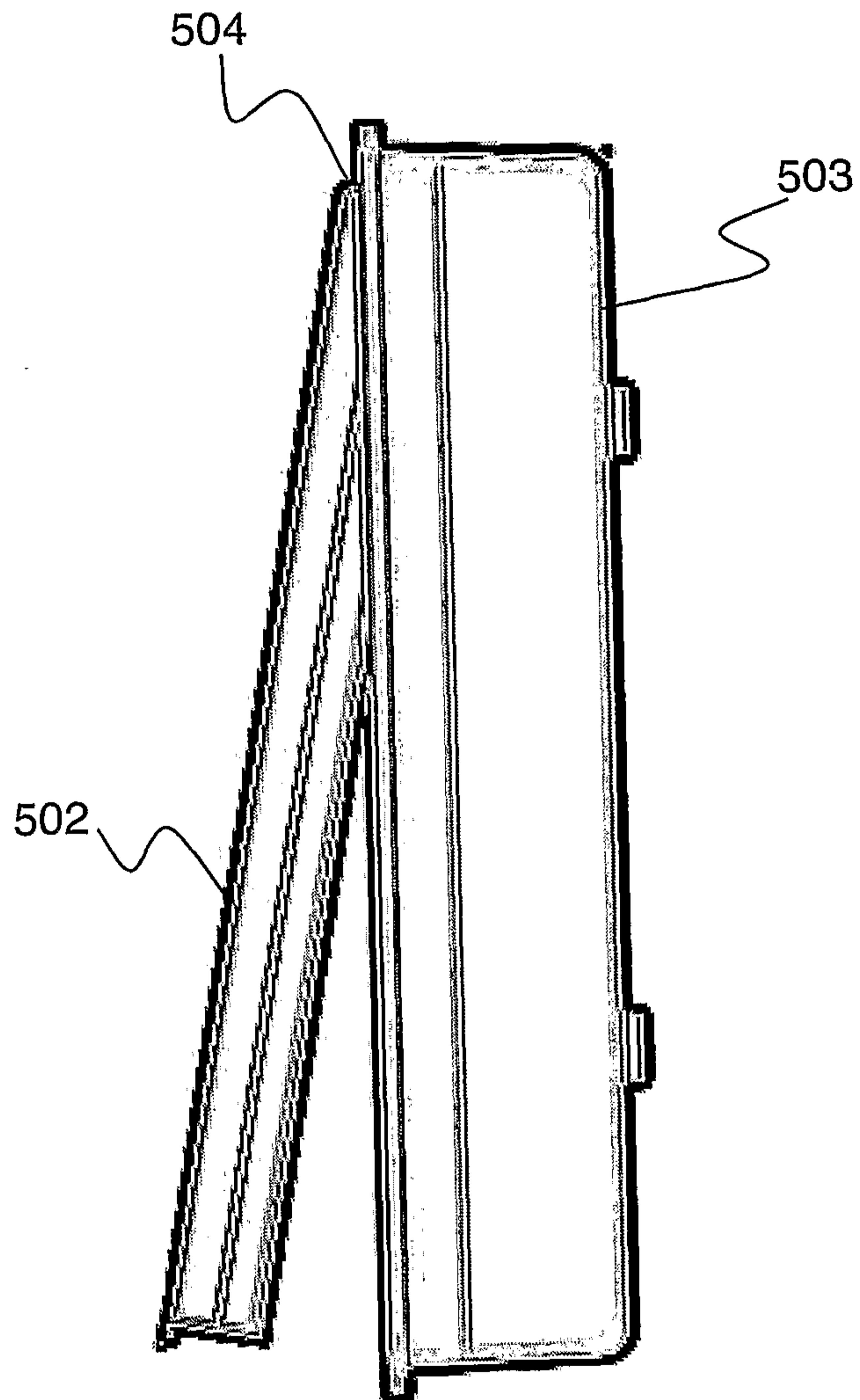


FIGURE 5C

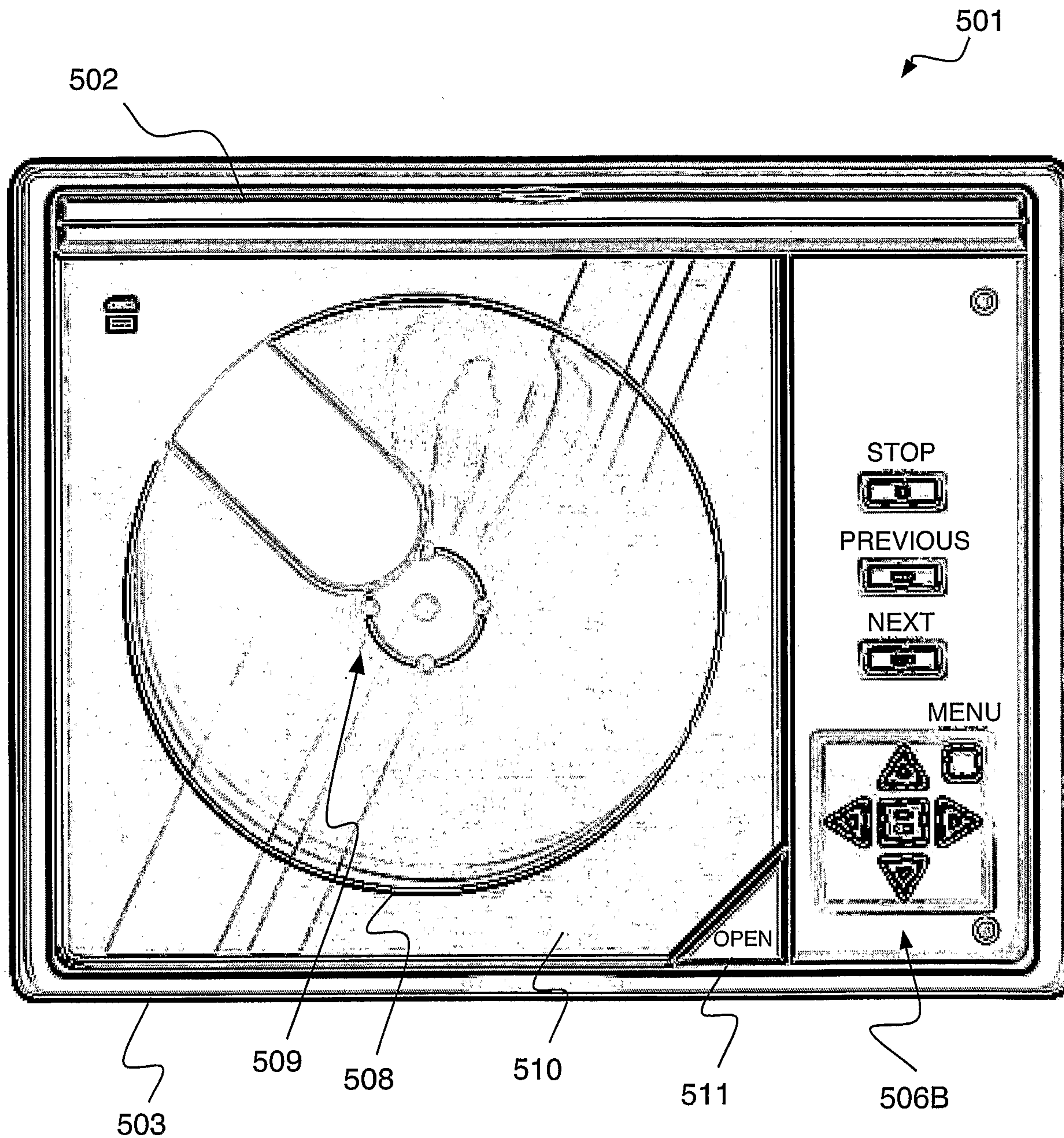


FIGURE 5D

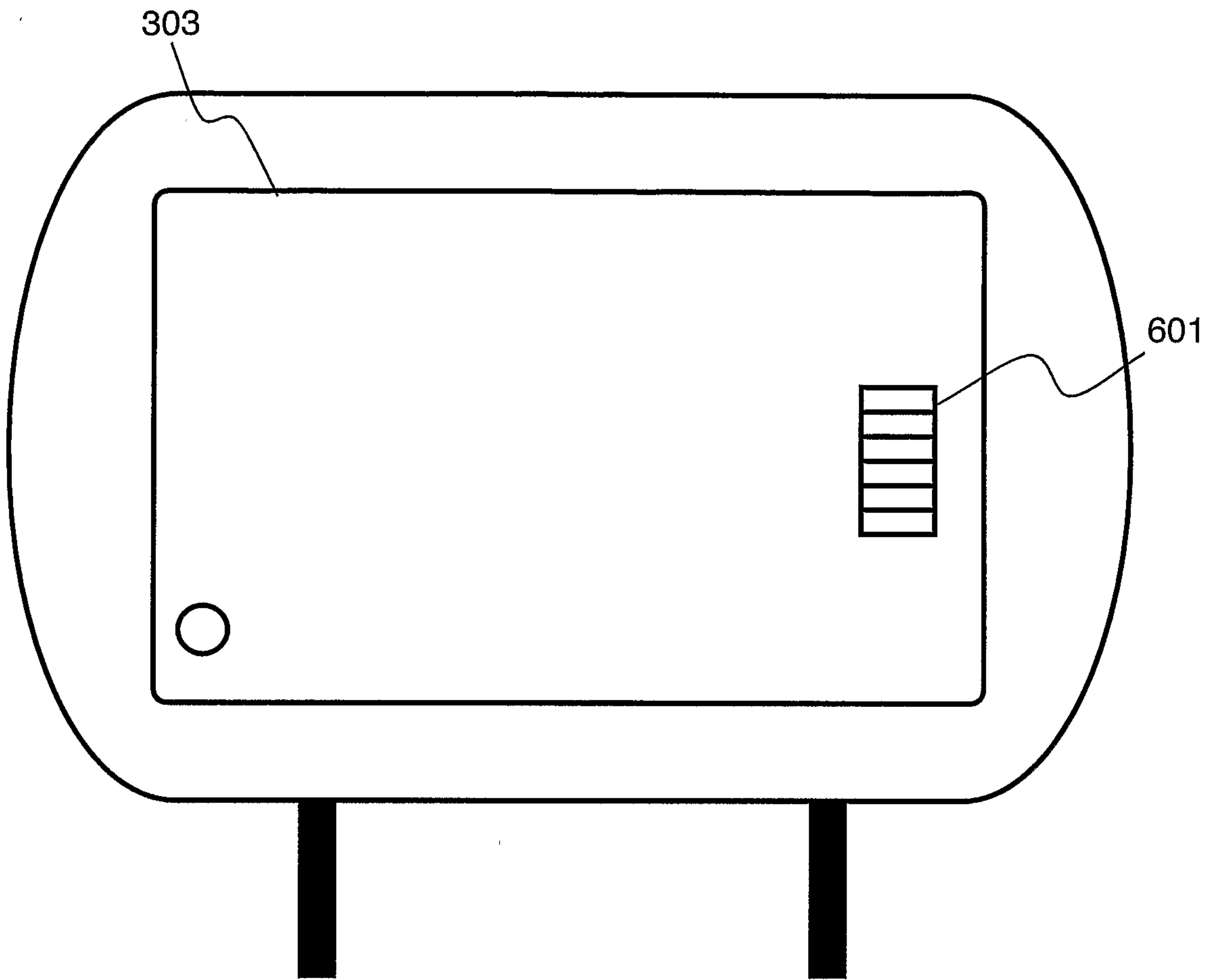


FIGURE 6A

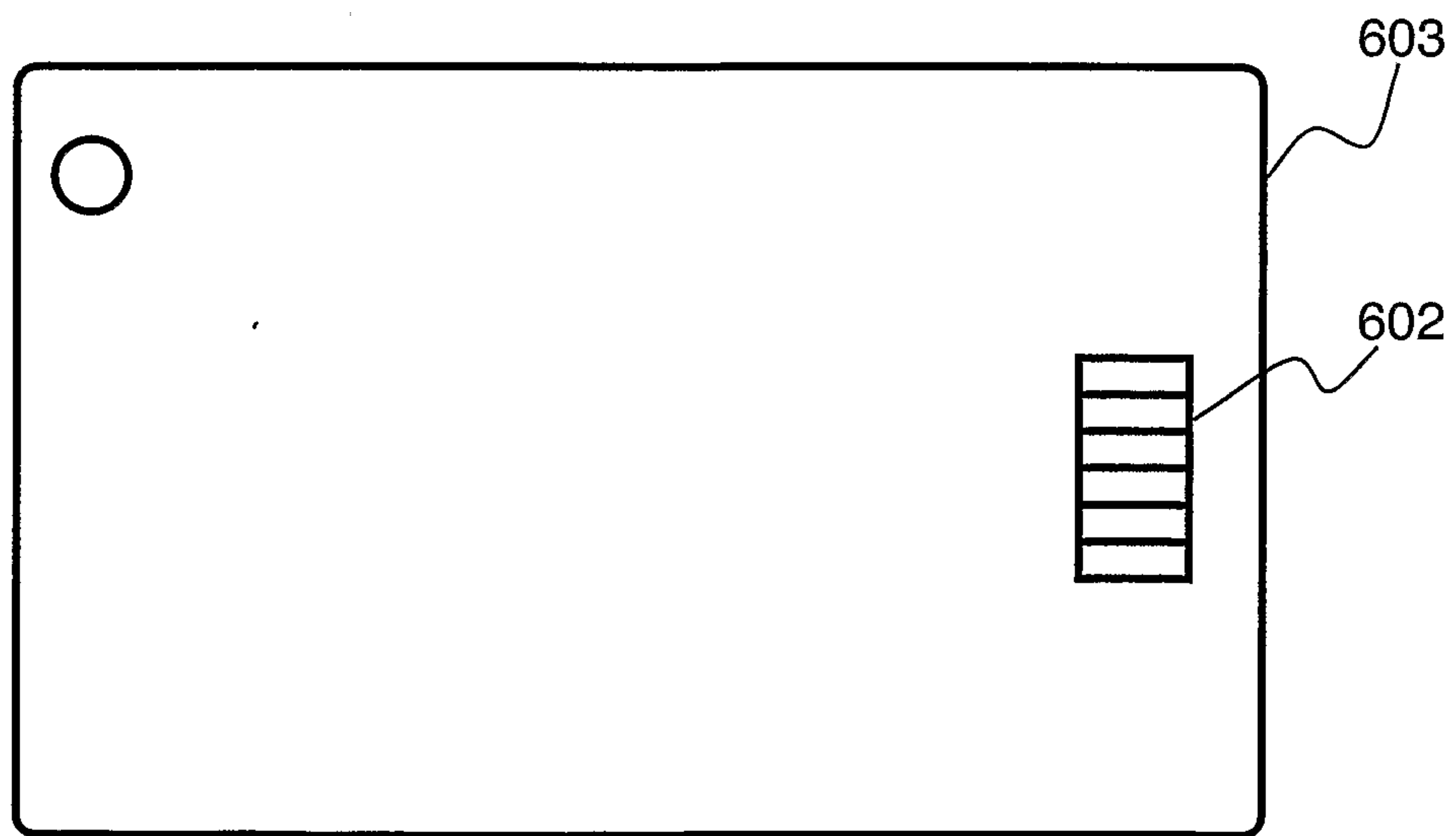


FIGURE 6B

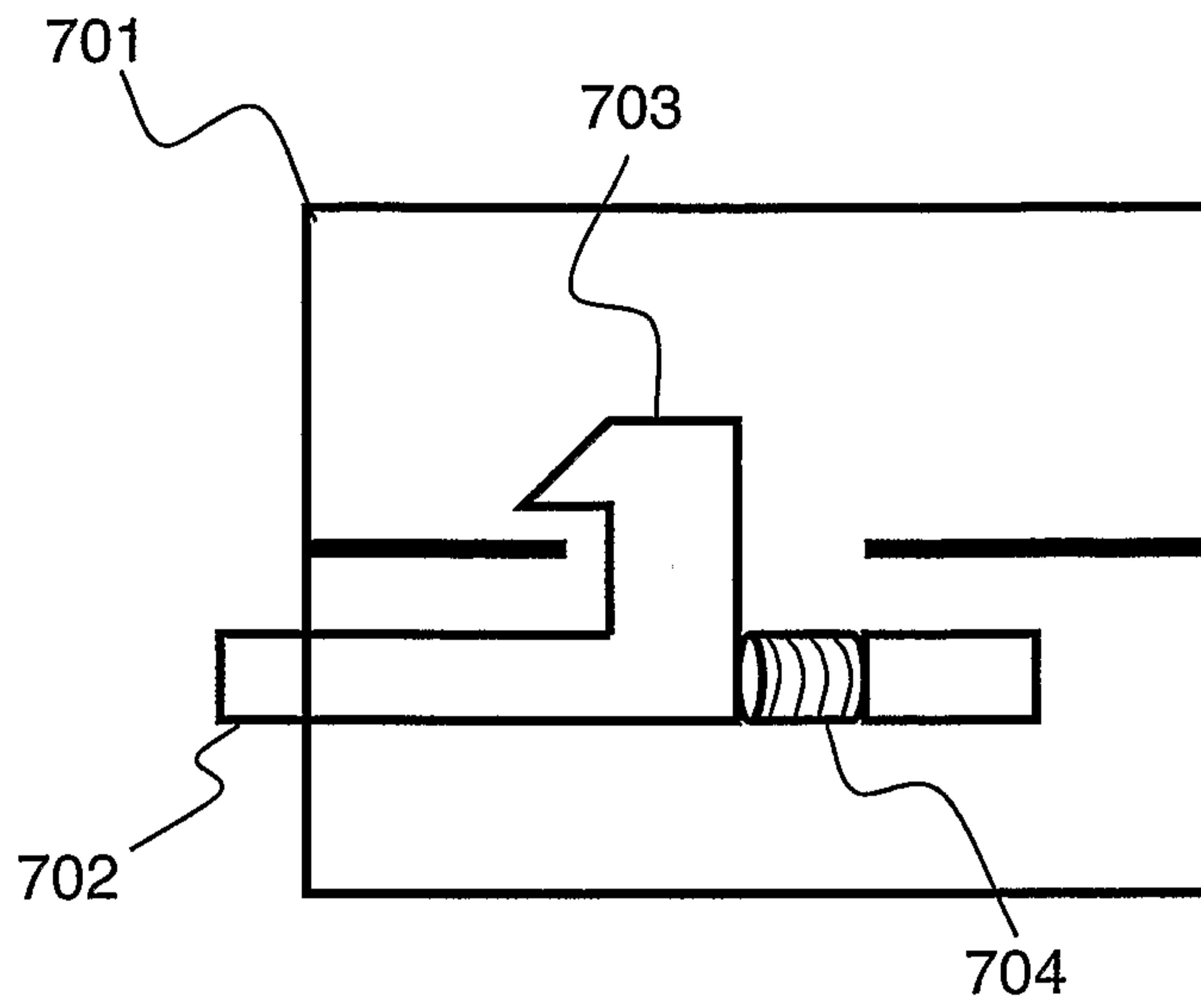


FIGURE 7A

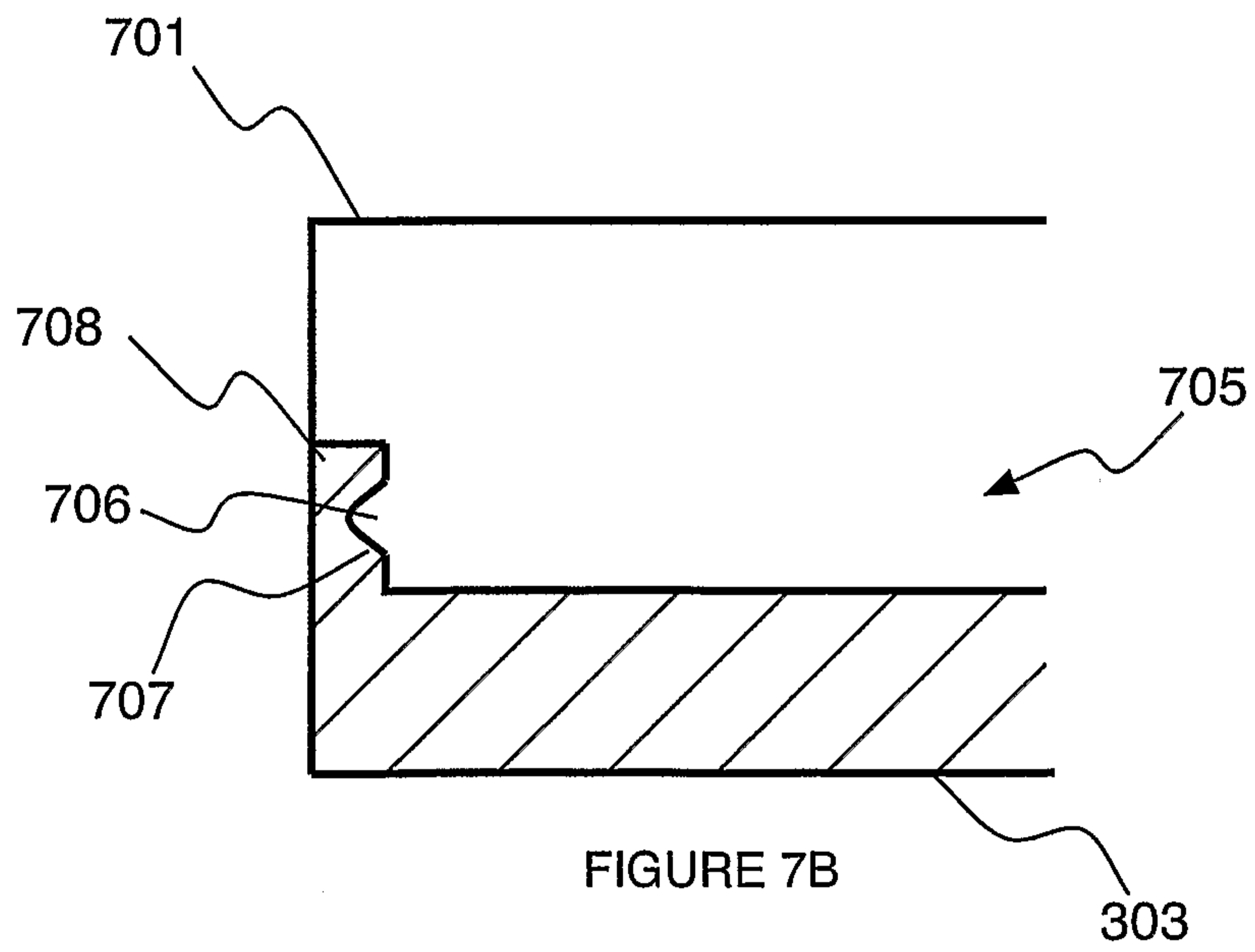


FIGURE 7B

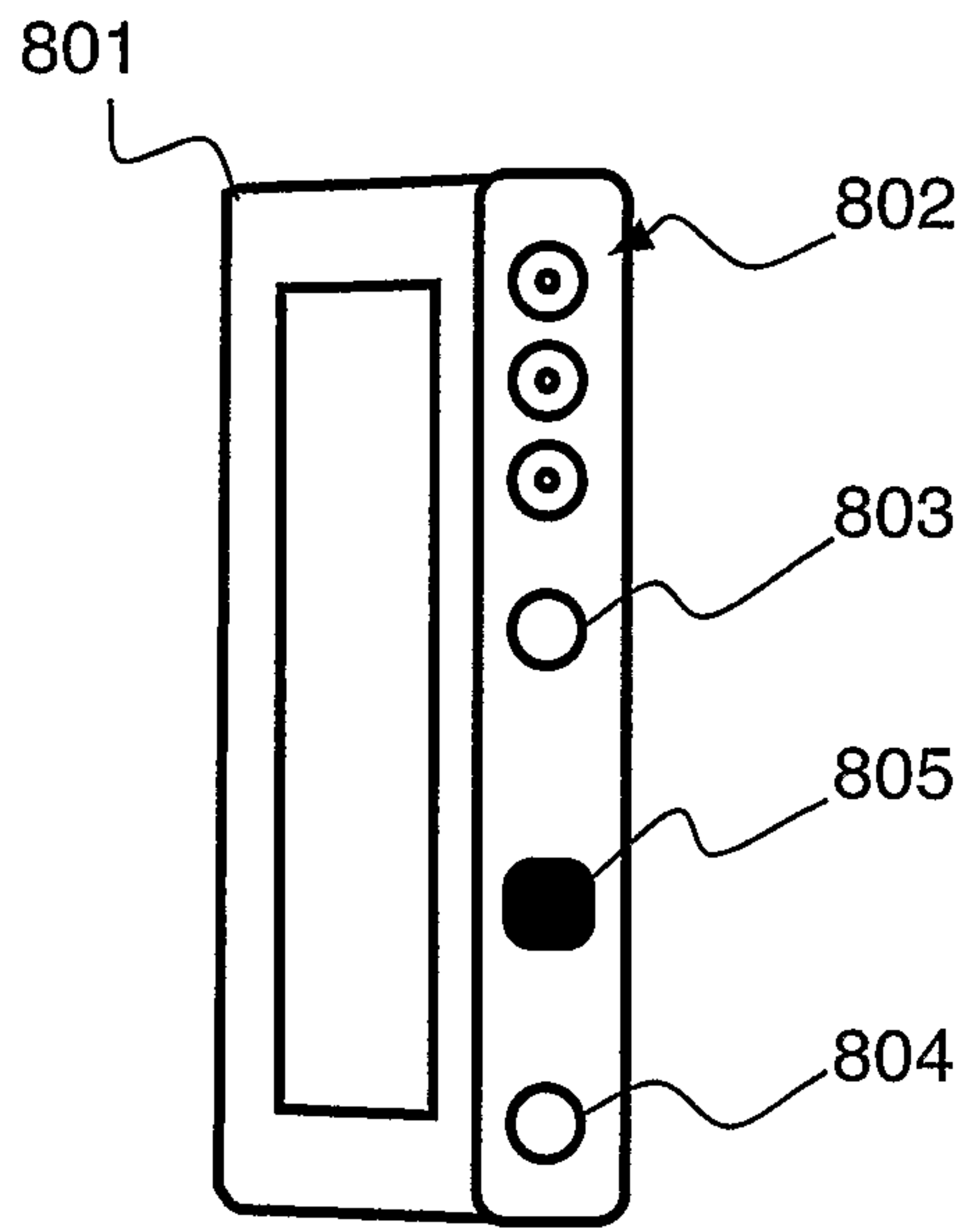


Figure 8

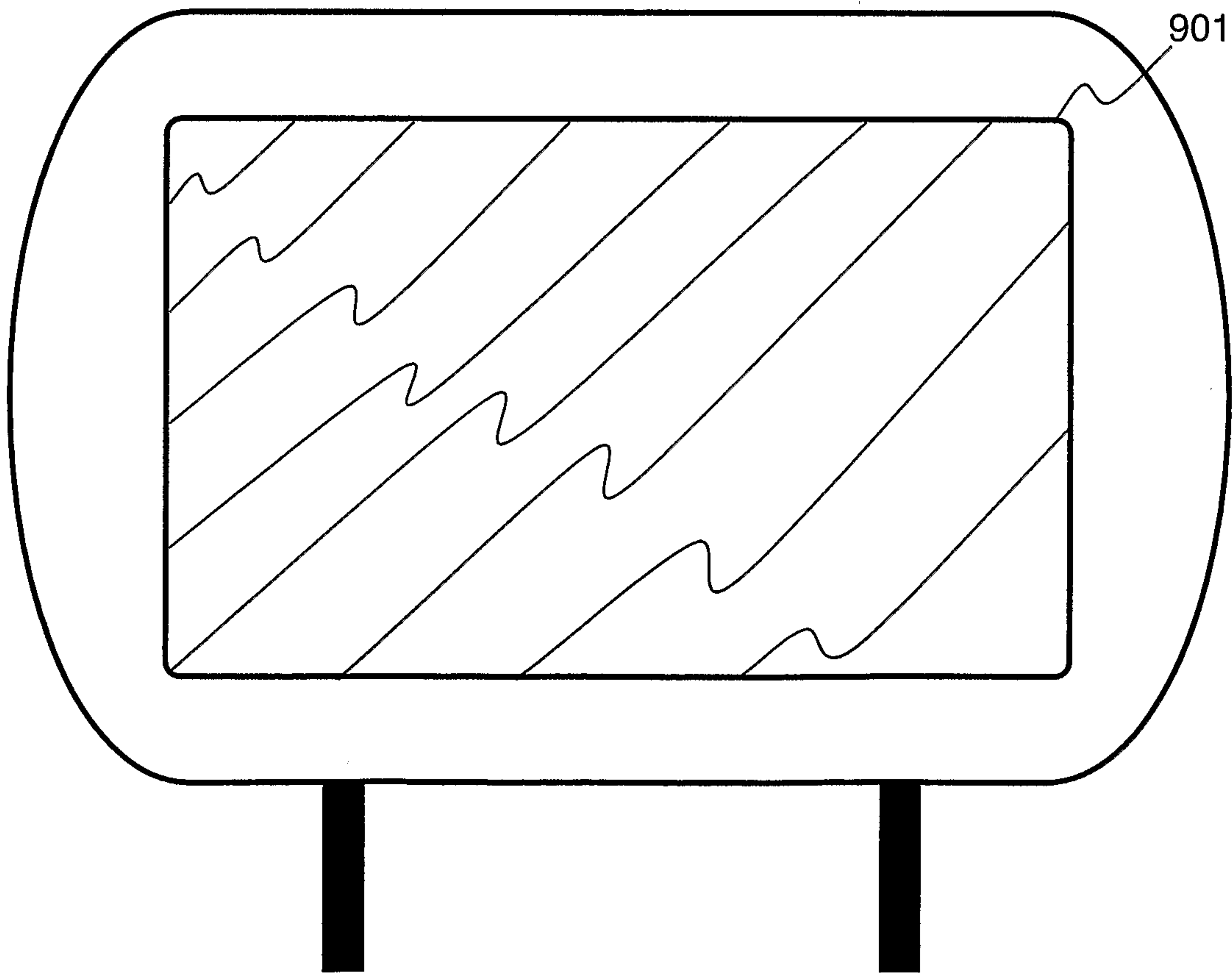


Figure 9

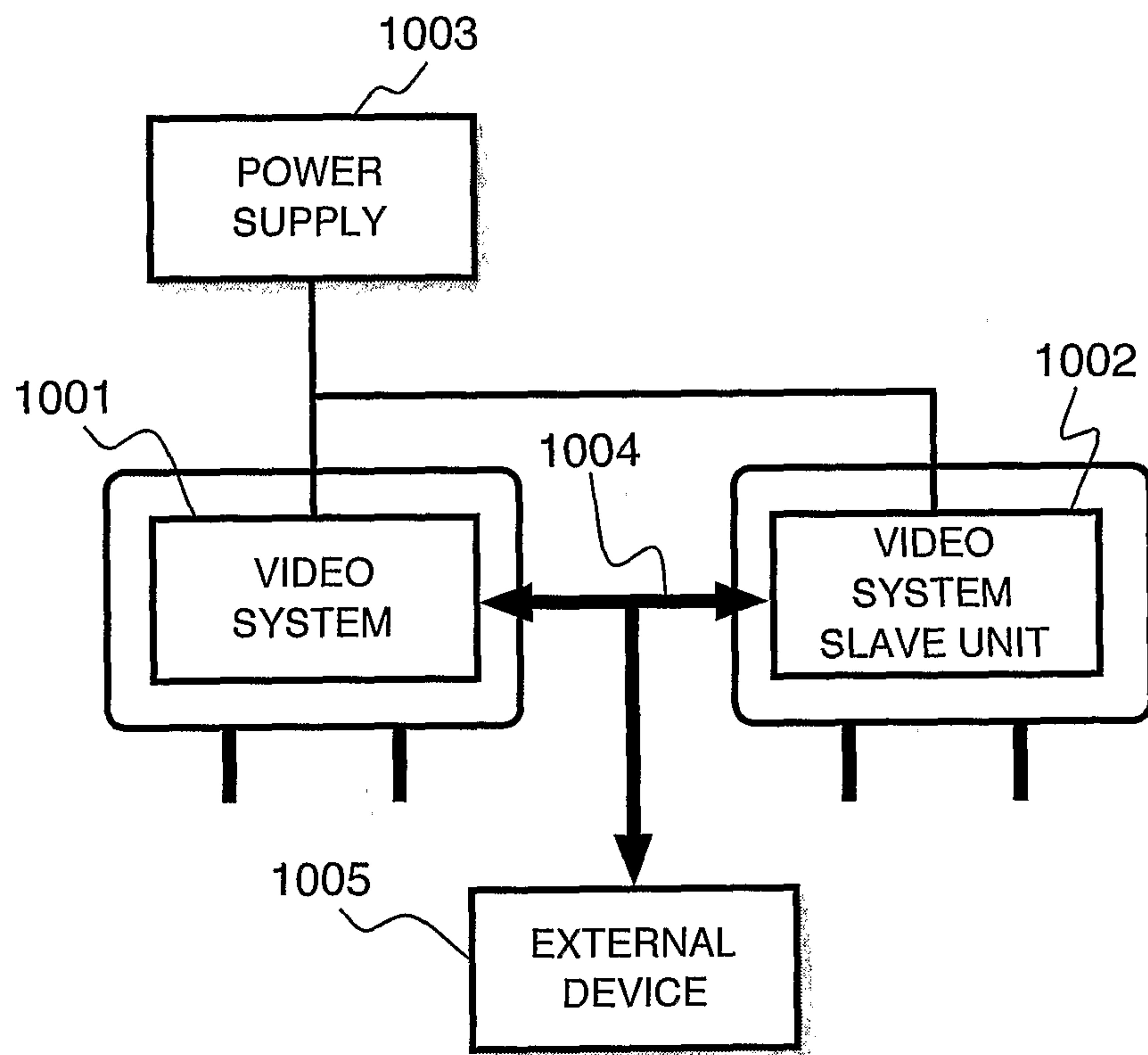


Figure 10

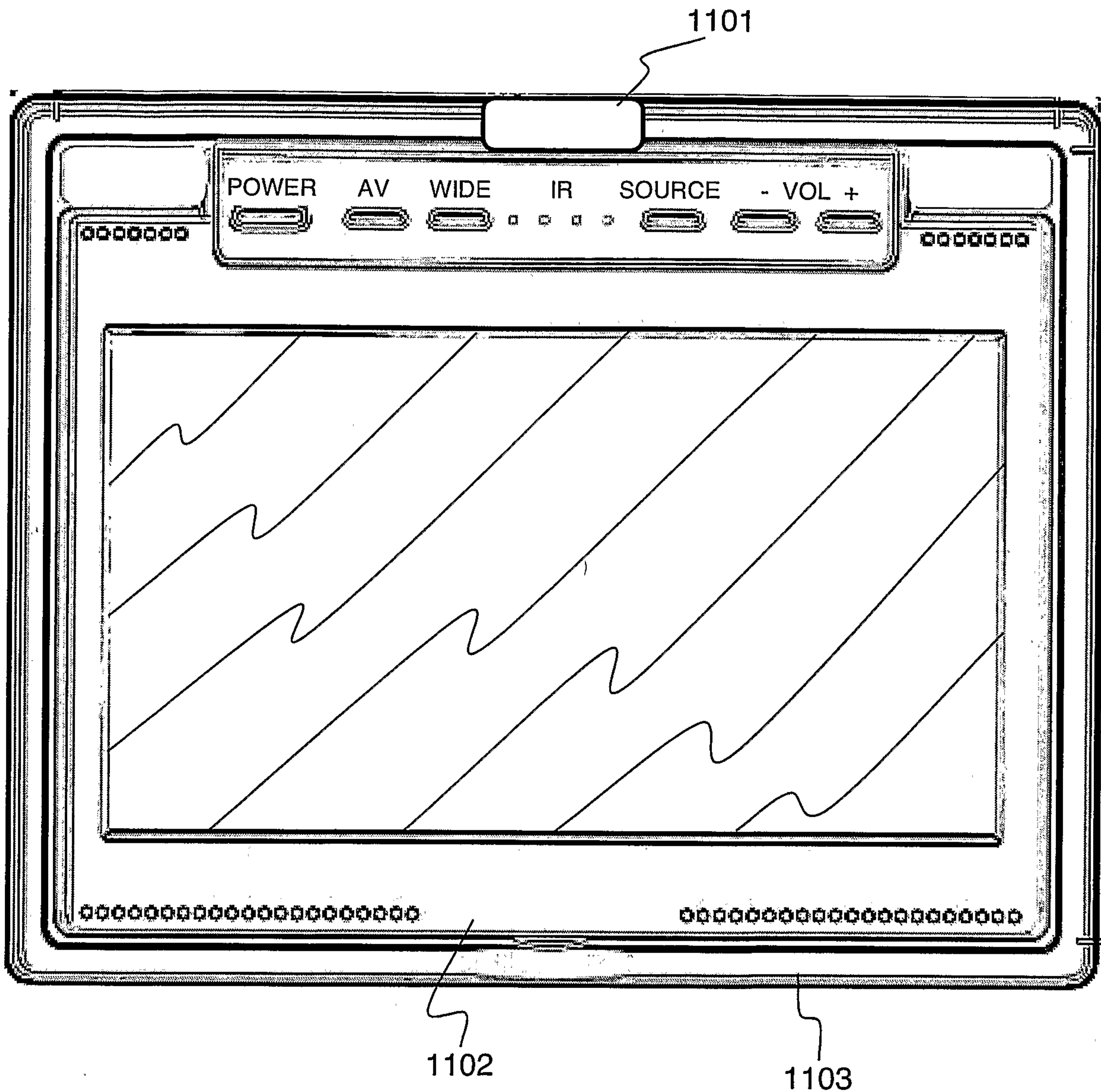


FIGURE 11A

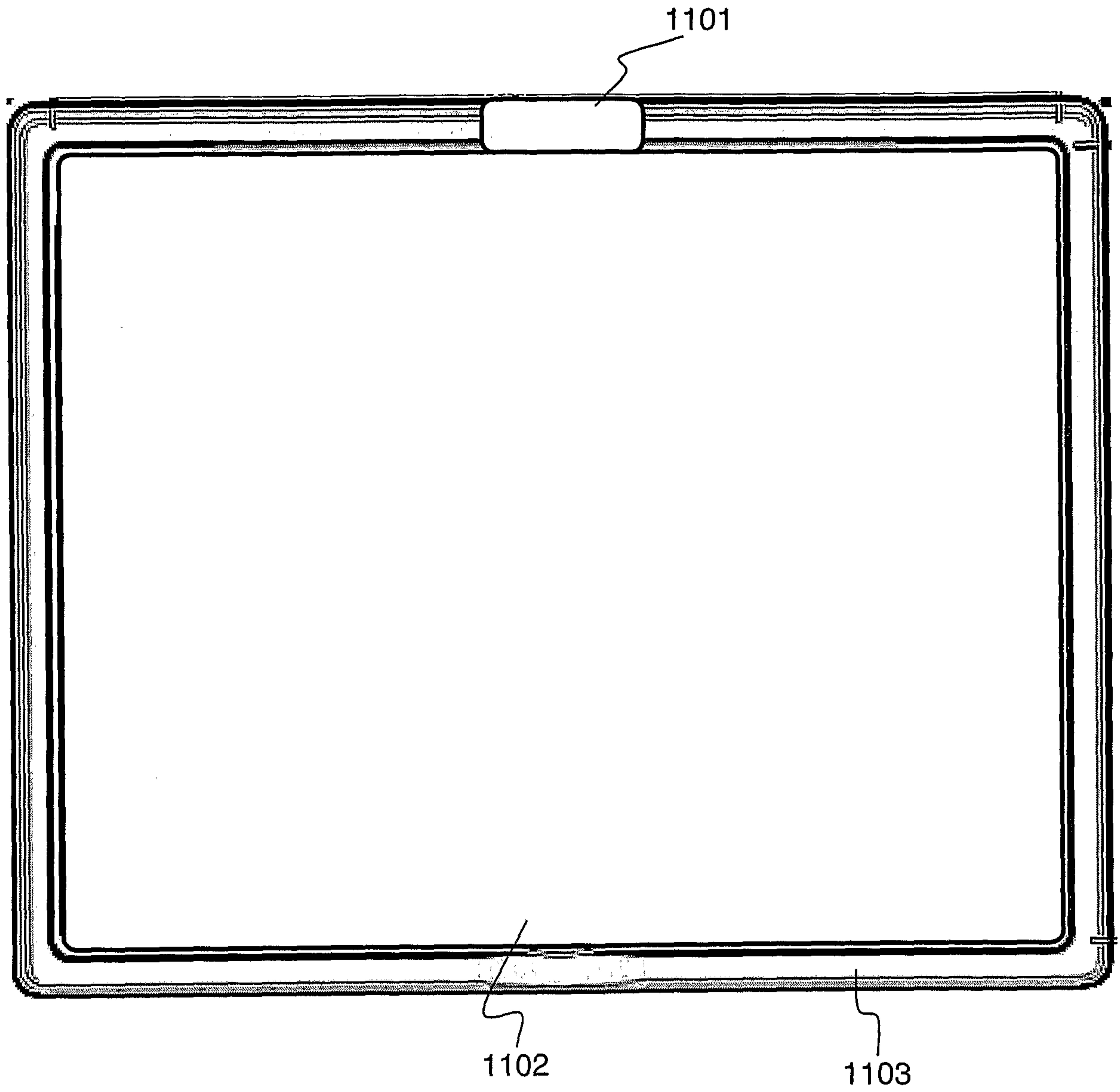


FIGURE 11B

501

506A

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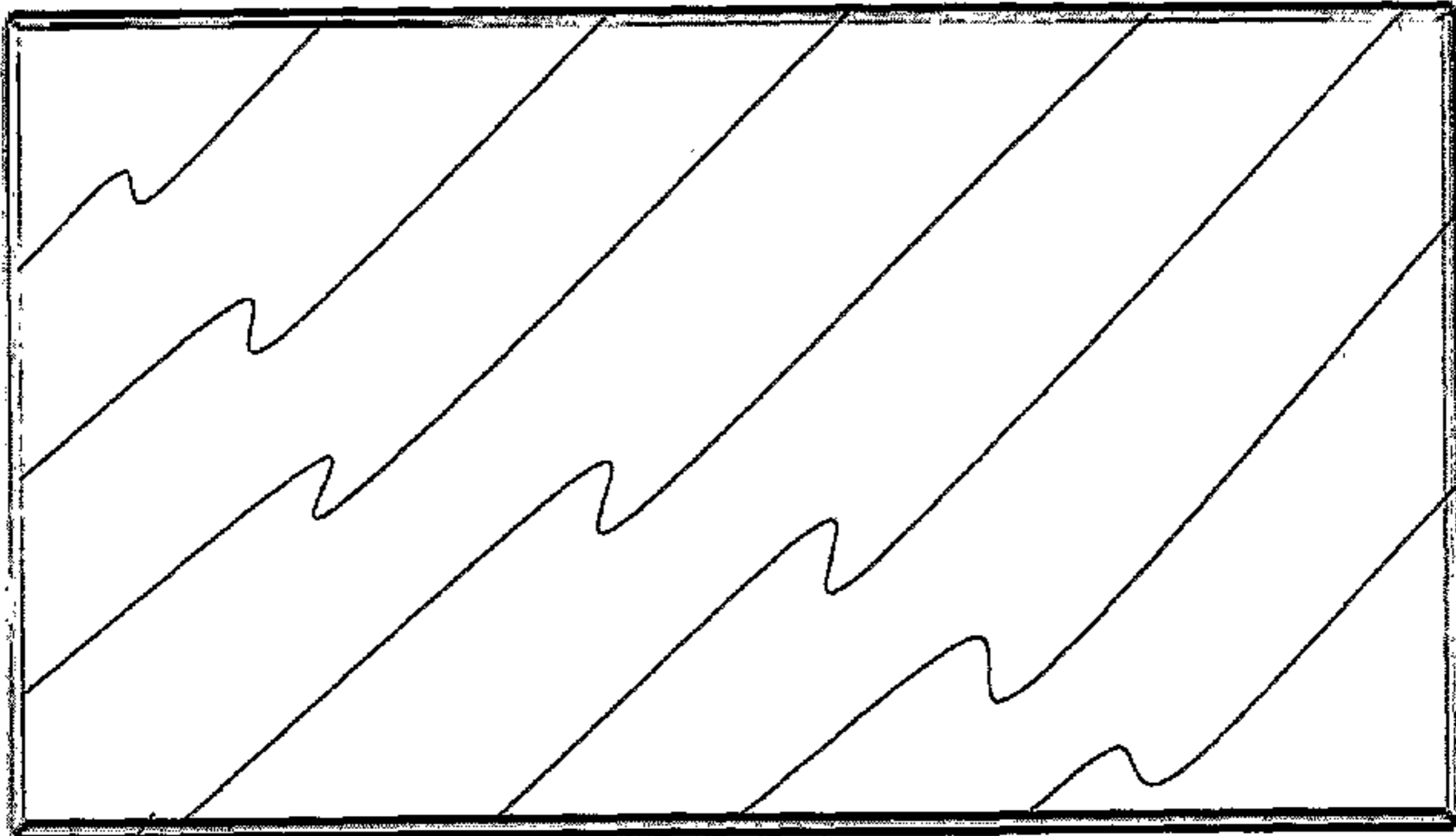
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