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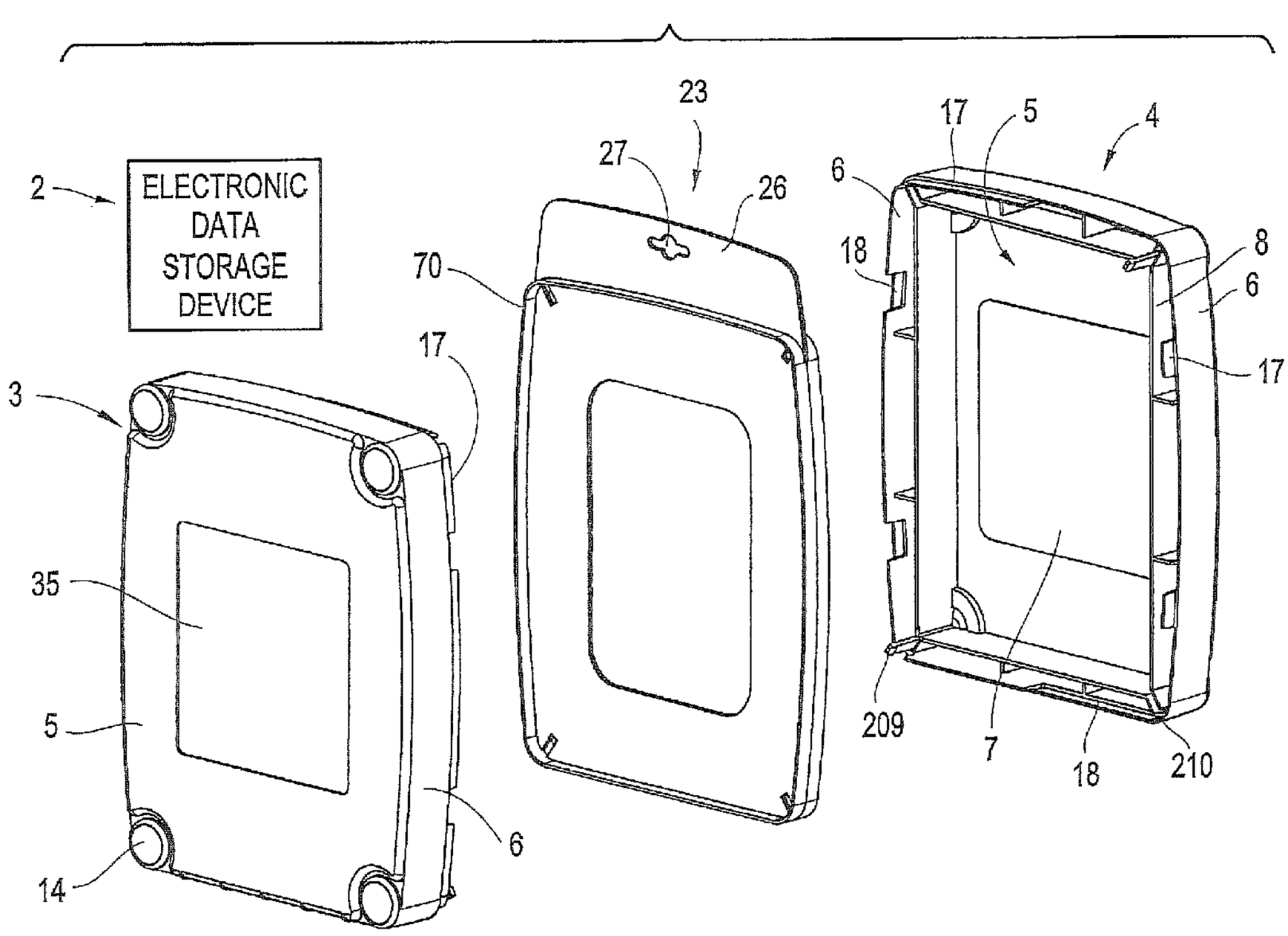
(54) Title: METHOD AND DEVICE FOR SECURE DISPOSAL OF AN ARTICLE

FIG.1a



(57) Abrégé/Abstract:
A method and structure for a secure storage container having a front and back shell and a locking mechanism built in such that the secure storage container cannot be opened after being closed and a disposal method utilizing the secure storage container.

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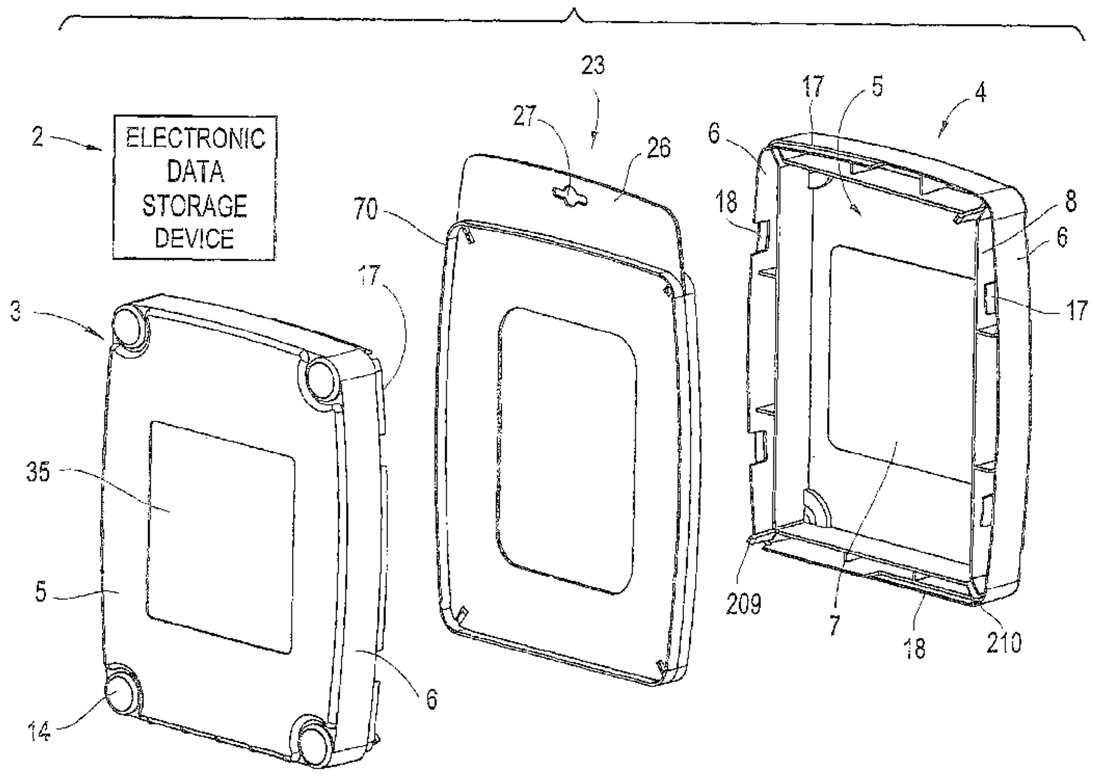
(54) **Title**: METHOD AND DEVICE FOR SECURE DISPOSAL OF AN ARTICLE

FIG.1a



(57) **Abstract**: A method and structure for a secure storage container having a front and back shell and a locking mechanism built in such that the secure storage container cannot be opened after being closed and a disposal method utilizing the secure storage container.

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METHOD AND DEVICE FOR SECURE DISPOSAL OF AN ARTICLE

Cross-Reference to Related Applications

The present Application claims priority to co-pending provisional application US 61/621,729, which is incorporated herein by reference in its entirety.

DESCRIPTION

Field of the Invention

The present invention relates generally to a method and device for the disposal of an article. In particular, the present invention relates to a secure disposal container and method of disposal thereof. More particularly, the present invention relates to a device and method for safely and securely destroying and, if desired, recycling electronic data storage devices such as hard drives, computers, cell phones or other electronic data-containing devices.

BACKGROUND OF THE INVENTION

Description of the Related Art

The inventors have found that there is a need for the safe and secure destruction of electronic data storage devices such as computers, computer and server hard drives, and other electronic data storage devices including, but not limited to, CD ROM discs, DVD discs, thumb drives and cell phones. These devices frequently contain a great deal of sensitive information which should be kept confidential and securely destroyed when no longer needed. In the absence of a secure disposal method, and with the appropriate

knowledge, technology, and protocols, this information is easily retrievable and can lead to identity theft, the exposure of sensitive personal and professional information, and other adverse effects.

SUMMARY OF THE INVENTION

In view of the foregoing, and other, exemplary problems, drawbacks, and disadvantages of the conventional systems, it is an exemplary feature of the present invention to provide a structure, system and method for the secure disposal of articles such as electronic data storage devices.

In a first aspect of the present invention, to achieve the above and other features, and purposes, described herein is a storage device including a front shell including a locking mechanism, and a back shell including a locking mechanism complementary to the locking mechanism of the front shell and configured such that, once engaged with the locking mechanism of the front shell, a cavity formed between the front shell and the back shell is closed and the front shell and the back shell cannot be separated without damaging the storage device.

Through the use of an electronics destruction container, which cannot be opened without visible signs of tampering or damage, it becomes possible to verify that sensitive information on electronic data storage devices placed therein has not been accessed from the time when the destruction container is closed by the user to the time when the destruction container reaches its destination and is disposed of.

Another exemplary aspect of the invention includes a method of disposing of an electronic data storage device. The method including providing to a user a disposal

container having a front shell and a back shell which include a locking mechanism configured so that once engaged the front and back shell cannot be separated without damage to the disposal container, the disposal container including a chamber within which is closed when the front and back shell are engaged together, placing an electronic data storage device into the chamber, joining the front shell to the back shell so as to engage the locking mechanism, transporting the disposal container to a disposal location, and disposing of the disposal container and the electronic data storage device therein without opening the disposal container.

Through the use of such a procedure, it can be ensured that sensitive information in electronic data storage devices has not been accessed before disposal.

Another exemplary aspect of the invention includes a system for securely disposing of an article. The system includes assigning an identification number to a disposal container, the disposal container including a chamber for storing the article and configured such that once closed the disposal container cannot be opened without damage, receiving registration information on the article including contact information from a user, receiving tracking information during transit of the disposal container from the user to a disposal facility, communicating the tracking information to the user, recording images of an inspection of the disposal container during receipt at the disposal facility, communicating the images of the inspection to the user, recording an image of the disposal container as it is being destroyed, and communicating the image of the disposal container as it is being destroyed to the user.

Such a system can allow a user to verify visually that their electronics disposal container and the electronic data storage device(s) placed therein have not been accessed before disposal.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other purposes, aspects and advantages will be better understood from the following detailed description of exemplary non-limiting embodiments of the invention with reference to the drawings, in which:

Figures 1a, 1b and 1c illustrate an exemplary embodiment of a disposal container 1;

Figure 2 illustrates an exemplary locking member (9, 10);

Figure 3 illustrates a cross section including a locking mechanism (9, 10) of the exemplary storage container 1 of Figure 1;

Figures 4a and 4b illustrate an exemplary spacer 23 for the exemplary storage container 1 of Figure 1;

Figure 5 illustrates an exemplary close-up view of lips 17 and side walls 6 of the exemplary storage container 1 of Figure 1;

Figures 6a and 6b illustrate another exemplary embodiment of the invention where multiple article cavities are present in the disposal container;

Figures 7a and 7b illustrate a cross-section of an exemplary locking mechanism of the exemplary storage container 201 of Figure 6;

Figures 8a and 8b illustrate an exemplary alignment mechanism of the exemplary storage container 201 of Figure 6;

Figure 9 illustrates cross-sections of the exemplary storage container 201 of Figure 6;

Figures 10a, 10b and 10c illustrate an exemplary plug 14 used to cover a hole at the locking mechanism (209, 210).

Figures 11a and 11b illustrate a top view and a side view of tray 350 of Figure 6;

Figure 12 illustrates an exemplary method of disposing of an electronic data device; and

Figures 13a and 13b illustrate an exemplary shell with an identification label 501.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS OF THE INVENTION

According to an exemplary embodiment of the present invention, an electronics disposal container 1 provides safe and secure destruction or recycling of electronic data storage devices 2 such as computer and server hard drives and other data storage devices including, but not limited to, CD ROM discs, DVD discs, thumb drives and cell phones. The electronics disposal container 1 includes a hollow container made of, for example, recyclable plastic or metal into which electronic data storage devices 2 are placed. Single-unit 1 (e.g., Figure 1) and multi-unit 201 (e.g., Figure 6) containers can be manufactured. The containers are manufactured with a locking mechanism that, once closed, cannot be opened without the device showing obvious signs of tampering.

The electronics disposal container 1 is a secure shipping and disposal device that remains tightly closed once the electronic data storage device(s) 2 are placed within it. The electronics disposal container 1 and the electronic data storage device(s) 2 therein

may then be shredded, burned or otherwise disposed of without the electronics disposal container 1 ever being opened once it has been closed.

The electronics disposal container 1 can be made of materials that are 100% recyclable through common recycling shredders (e.g., plastic, metal, resin, etc.).

As can be seen in Figures 1a-1c, in an exemplary embodiment, the device includes two ends. For the sake of simplicity, one is referred to as a front shell 3 and the other as a back shell 4. Of course, the front shell 3 and back shell 4 may be structurally the same. Indeed, in an exemplary embodiment the front shell 3 and back shell 4 are structurally the same or identical.

Each of the front shell 3 and back shell 4 includes a base portion 5, side walls 6 extending around the perimeter of the shell from the base portion 5, and interior walls 8. When joined the respective interior walls 8 of each shell define a cavity 7 inside (e.g., See Figure 1).

As can be seen in Figures 2, 3a and 3b, each of the front shell 3 and the back shell 4 includes locking members. An exemplary embodiment of the locking members include a male locking pin 9 having an arrow head style locking mechanism which can fit into a female locking slot 10.

The length of the shaft 11 from the base 12 to the tapered head 13 of the male portion of the locking pin 9 is slightly longer than the depth of the female locking slot 10 of the locking mechanism prior to a locking surface/ridge 21, so that the tapered head 13 can clear the ridge 21. When the male and female portions of the locking mechanism are fully engaged, they assume their original dimensions and they cannot be withdrawn from

one another. The electronics disposal container 1 is designed so as to never be reopened after its initial closure.

In an exemplary embodiment, the locking mechanism may include a tapered head 13 on a distal end of the male locking pin 9 which is configured to fit into a female locking slot 10. The female locking slot 10 includes a hollow cavity 19. The space between the side walls 20 of the hollow cavity 19 is slightly wider than the thickness of the shaft 11 of the male locking pin 9 and narrower that the base of the tapered head 22. The sidewalls of the female locking slot 10 are pliable and are designed so that the space between them can widen as the tapered head 13 passed between them on closure but they return to their original configuration once the tapered head 13 passes ridge 21 thus preventing removal of the male portion of the locking mechanism from the female portion of the locking mechanism once locking system is closed. The female locking slot 10 may end where the female portion of the locking mechanism widens to create a ridge 21 beyond which the tapered head 13 can be passed so as to lock the locking system. The tapered head 13 tapers toward the distal end of the male locking pin 9. The base 22 of the tapered head 13 connects to the shaft 11 of the male locking pin 9. The base 22 of the tapered head 13 may extend in a direction orthogonal to the axial direction of the male locking pin 9 so as to provide a surface which can lock against the inner ridge 21 of the female locking slot 10.

When formed, both the front and back shells can have the base of the male and female locking members open to an outside of the respective shell. This improves molding efficiency. The holes are then covered with plug 14. An exemplary plug 14 is illustrated in Figures 11A-11C.

In an exemplary embodiment, the front shell 3 and back shell 4 can fit together to form a single chamber 7 therein. This single chamber 7, optionally, may be the size of a hard drive or other electronic data storage device 2. Alternatively, the electronics disposal container 1 can have a front shell 3 and back shell 4 formed with multiple chambers 7. In one aspect of the invention, the depth of the complementary sides of chamber 7 in each of the front and back shell (3, 4) are the same.

In order to prevent the shells from locking together prematurely, the front and back shell (3, 4) may have a spacer 23 placed between them prior to use, as shown in Figure 1. As illustrated in Figures 4A and 4B, such a spacer 23 maybe formed with holes 24 complementary to the male locking pins. The spacer 23 can have raised lips 70 on its outer perimeter to engage with the perimeter edges of the front and back shell (3, 4). The spacer 23 can include a tab 26 which is an extension of the spacer 23 above the perimeter lips and include instructions and a hanging hole 27 for storage in a store display. This can also allow a simple shrink wrap band to enclose the container for packaging which can produce substantial packaging savings.

As shown in Figure 5, for increased security, the front and back shells (3, 4) can include lip(s) 17 which extend toward the opposite shell. Such lip(s) 17 may be arranged in a spaced manner or continuously around the perimeter of the side walls 6 so as to completely seal the perimeter between the front shell 3 and the back shell 4 when they are locked together. Such a configuration may include a recess(es) 18 in side wall 6 of the opposite shell into which the lip(s) 17 may be accommodated. The lip(s) 17 and the opposing recess(es) 18 may be located on the interior side of the side wall 6. In areas where the lip(s) 17 is an extension of the exterior portion of side wall 6, the opposing

recess(es) is located on the exterior portion of side wall 6 of the opposing shell and in areas where the lip(s) 17 is an extension or the interior portion of side wall 6, the opposing recess(es) is located on the interior portion of side wall 6 of the opposing shell. Because the shells are identical and complementary when they are locked together, this provides a lip around the entire perimeter of the shell preventing access to its interior without showing signs of damage.

As shown in Figures 6a-9, another exemplary embodiment of the invention includes a disposal container with multiple layers with multiple cavities per layer. Exemplary embodiments of the multi-layered / multi-cavity unit 201 can be the same as those of the single unit 1 except the front shell 203 and the back shell 204 have multiple cavities within their interior walls 273 and the number of cavities within the unit can be increased with the addition of an intermediate tray 350 or trays.

In an exemplary embodiment, the multi-layered / multi-cavity unit 201 has two ends with a front shell 203 and the back shell 204 formed with a locking mechanism in each corner. Each locking mechanism is made with a male locking pin 209 that can fit into a female locking slot 210 on an opposing and complementary shell.

In addition, the front shell 203 and the back shell 204 can include male alignment pins 215 that fit into female alignment slots 216 on an opposing and complementary shell. These male alignment pins 215 may be alternated with the male locking pins 209 and the female locking slots 210 may be alternated with the female aligning slots 216 around a perimeter of the front shell 203 and the back shell 204.

Thus, in an exemplary embodiment the front shell 203 can be connected directly to the back shell 204 to produce a complete unit with, for example, six cavities formed by

the front shell 203 and the back shell 204. When engaged, the alignment pin(s) and locking pin(s) on one shell engage with the opposing alignment slot(s) and locking slot(s) on the opposing and complementary shell and the shells cannot be separated without showing signs of tampering.

In an exemplary embodiment, an intermediate tray (or trays) 350 is placed between the front shell 203 and the back shell 204. Each tray 350 also has multiple cavities within their interior walls 373 that align with the interior walls of each shell 273 or other trays 373.

As illustrated in exemplary Figure 11A and 11B, the intermediate tray 350 may be formed so as to have male locking pins 309, female locking slots 310, male alignment pins 315, and female alignment slots 316 that can engage respectively with the female locking slots 210/310, male locking pins 209/309, female alignment slots 216/316, and male alignment pins 215/315 on opposing and complementary shells 203/204 or trays 350. The multiple layer system allows the front shell 203 to lock onto an intermediate tray 350, intermediate trays 350 to lock into each other, and similarly allows the back shell 204 to lock on to an opposite side of an intermediate tray 350.

In other words, the front shell 203 may be locked directly to an intermediate tray 350 independent of any other intermediate tray 350 or back shell 204, multiple intermediate trays 350 may be locked to other intermediate trays 350 independent of the front shell 203, other non-adjacent intermediate trays 350, and the back shell 204 and the back shell 204 may be locked to the final intermediate tray 350 independent of any other non-adjacent intermediate tray 350 or the front shell 203. Thus, while the multi-layer

unit 201 is being filled, the intermediate trays 350 can optionally be locked into place one by one as each layer is filled. This may provide increased stability and security.

As illustrated in Figures 7A and 7B, by designing the shells 203, 204 and the tray(s) 350 with complementary elements it is possible to stack multiple intermediate trays 350 between the front shell 203 and the back shell 204. For instance, the front shell 203 can lock onto a first intermediate tray 350 which in turn locks onto a second intermediate tray 350, the second intermediate tray 350 locks onto a third intermediate tray 350, and so on. The last intermediate tray 350 opposite the front shell 203 locks onto the back shell 204 creating a fully sealed structure with the front and back shells (203, 204) disposed on opposite sides of the intermediate trays 350.

With the use of alternating male and female locking mechanisms 209, 210 and alignment pins 215, 216 around a perimeter of the shells and alternating male and female locking mechanisms 309, 310 and alignment members 315, 316 around a perimeter of the trays, in an exemplary embodiment of the front and back shells (203, 204) can be made interchangeable. To lock the front shell 203 to the back shell 204 the shells are positioned so that the male and female locking members (209, 210) and the male and female alignment members (215, 216) are aligned. Similarly, only one form of an intermediate tray 350 is needed. Such uniformity can reduce production and logistical costs by limiting the number of different parts needed to be manufactured and inventoried. For instance, in a multiple layer device 201 only three types of parts may need to be molded for the enclosure shells/trays (e.g., the front/back shell part, the intermediate tray(s) part, and plugs).

As illustrated in figures 7a and 7b the multi-layer electronics disposal container 201 can utilize a locking system which, in the case of the front and back shells 203/204, includes a male locking pin 209 with a tapered head 213 on its distal end which is configured to fit into a female locking slot 210 of a shell 203/204 or a female locking slot 310 of a tray 350. The locking system also includes a female locking slot 210. The female locking slot 210 includes a hollow cavity 219. The cavity 219 can be formed by side wall 220. The female locking slot 210 may end at a ridge 221 past which the tapered head 213 can be inserted so as to lock the locking system. The length of the shaft 211 of the male locking pin is greater than a length of the female locking slot 210 so that the tapered head 213 extends past the ridge 221when the locking system is closed. The tapered head 213 can taper toward the distal end of the male locking pin 209 to ease closure. The base 222 of the tapered head 213 connects to the shaft 211 of the male locking pin 209. The base 222 of the tapered head 213 may extend in a direction orthogonal to the axial direction of the male locking pin 209 so as to provide a surface which can lock against the inner ridge 221 of the female locking slot 210. In addition, the tapered head 213 and the distal portion of the shaft 211 may include a slit portion 271 disposed, for example, in a center thereof and extending in the axial direction. The base of the tapered head 222 may be wider than the width of the cavity 219/319 in the female locking slot 210/310 at the ridge 221/321. The slit portion 271 allows the tapered head and shaft to compress inward when inserted into the female locking slot 210, and to expand, optionally to its original shape, when the tapered head passes beyond ridge 211. The base 222 of the tapered head 213 may extend in a direction orthogonal to the axial

direction of the male locking pin 209 so as to provide a surface which can lock against the inner ridge 221 of the female locking slot 210.

The intermediate tray 350 also utilizes a locking system which includes a male locking pin 309 with a tapered head 313 on its distal end which is configured to fit into a female locking slot 210 of a shell 203/204 or the female locking slot 310 of a tray which is a compliment to the system of the front shell 203 and the back shell 204. This locking system also includes a female locking slot 310 which is configured receive a male locking pin 209 of a shell 203/204 or a male locking pin 309 of a tray which is a compliment to the system of the front shell 203 and the back shell 204. The female locking slot 310 includes a hollow cavity 319. The cavity 319 can be formed by side wall 320.

The female locking slot 310 may end at a ridge 321 past which the tapered head 313 can be inserted so as to lock the locking system. A length of the shaft 311 of the male locking pin 309 is greater than a length of the female locking slot 310 so that the tapered head 313 extends past the ridge 321. The tapered head 313 can taper toward the distal end of the male locking pin 309 to ease closure. The base 322 of the tapered head 313 connects to the shaft 311of the male locking pin 309. The base 322 of the tapered head 313 may extend in a direction orthogonal to the axial direction of the male locking pin 309 so as to provide a surface which can lock against the inner ridge 321 of the female locking slot 310. The base of the tapered head 322 is wider than the width of the cavity 219/319 in the female locking slot 210/310 at the ridge 221/321.In addition, the tapered head 313 and the distal portion of the shaft 311 may include a slit portion 371 disposed, for example, in a center thereof and extending in the axial direction. The slit

portion 371 allows the tapered head and shaft to compress inward when inserted into the small width portion 326 of the female locking slot and to expand, optionally to its original shape, when the tapered head passes into the large width portion 375.

In an exemplary embodiment of the intermediate tray 350, the location where male locking pin 309 extends outward from the tray is aligned with the location where, on an opposite side of the intermediate tray, the female locking slot 310 goes onto the tray.

As can be seen in Figure 8A and 8B, male alignment pins and female alignment slots may be included in the front 203 and back 204 shells and on the tray 350. In an exemplary embodiment, the male locking pins 209 and female locking slots 210 can be alternately provided around a perimeter of the front 203 and back shell 204. In such a structure, male aligning pins 215 can be disposed near the female locking slot 210 and the female aligning slot 216 can be disposed near the male locking pin 209 (e.g., a male locking pin is disposed in the same corner as a female alignment slot and a female locking slot is disposed in the same corner as a male locking pin). Similarly, on the tray 350, male aligning pins 315 can be disposed near the female locking slot 310 and the female aligning slot 316 can be disposed near the male locking pin 309 (e.g., a male locking pin is disposed in the same corner as a female alignment slot and a female locking slot is disposed in the same corner as a male locking pin). In other words, the male alignment pins 315 and female alignment slots 316 can be arranged on the intermediate tray 350 so as to be complementary with the alignment pins of the front and back shells.

The alignment pins can allow greater stability when locked and a more robust resistance to torsion. Such an arrangement can also allow the shells/intermediate trays to be stable when placed on a flat surface because the alternating male alignment pins 215/315 and male locking pins 209/309 rise an equal distance from the edges of the trays.

After being formed, for example through injection molding, both the front/back shells (203, 204) can have the base of the male or female locking portion (209, 210) open to an outside of the respective shell. This structure improves molding efficiency and costs. The holes are then plugged with plugs 214.

In one aspect of the invention, the front and back shells (203, 204) can have inner walls 273 to provide multiple chambers 274. The intermediate tray(s) 350 also include inner walls 373 on both sides which are complementary to the inner walls 273 of the front and back shells. Thus, when joined the inner walls 273 of one shell (or the inner walls 373 of an intermediate tray) align with the inner walls 273 of the opposite shell (or the inner walls 373 of an intermediate tray) so as to form the multiple chambers 274. For instance, as illustrated in Figure 6, both the front shell 203 and the back shell 204 each have inner walls 273 which form six chambers 274.

Similarly, the intermediate trays 350 include inner walls 373 so as to form six chambers 274 on each side thereof. Thus, a combination of a front shell 203, an intermediate tray 350, and a back shell 204 will have twelve chambers 274. By adding an additional intermediate tray 350 the number of chambers 274 is increased to eighteen chambers. Of course, any number in chambers 274 can be formed in each shell/tray so as to suit the size of the devices stored and the size of the shells.

For increased security, the front and back shells (203, 204) can include lips 217 which extend in toward the opposite shell. Such lips 217 may be arranged in a spaced manner or alternately and can be arranged so as to completely seal the perimeter between the front shell 203 and the back shell 204 as shown. Such a configuration may include a recess 218 in the side wall 206 of the opposite shell into which the lip 217 may be accommodated. The lip 217 and the recess 218 may be located on either the interior or exterior edge of the side wall 206.

Similarly, intermediate tray 350 can include lips 317 and recesses 318 which are complementary with the front shell 203 and the back shell 204.

As in the single unit, a spacer may be provided between the front and back shells (203, 204) and the intermediate tray(s) 350 prior to use to ensure the locking members do not prematurely engage.

The procedure for distributing and disposing of, the electronics disposal container can be conducted in many ways.

Figure 12 illustrates an exemplary process for disposing of an article. In the exemplary embodiment, a user may purchase the electronics disposal container 1/201 online or at retail outlets individually or as part of an order when purchasing a new electronic device S1. In addition to the electronics disposal container, the customer would receive initial instructions directing the customer to a web site that contains more detailed instructions and a customer questionnaire, a shipping package 401 that the customer will use to return the disposal container and its contents to the destruction facility and stick-on labeling materials.

In the exemplary case of hard drives, the customer can remove the hard drive from his/her computer personally or the customer can have the hard drive removed from their computer at a retail outlet.

To maintain security for the customer, the system/method of the present invention will be able to provide a secure chain of custody for the device through the entire logistics and recycling process.

For instance, the electronics disposal container may include instructions printed (stored) inside at the time of purchase or delivery. In addition, instructions can be printed on the shells or the spacer 23. Such instructions can be related to the proper use of the container and may include a web address where additional information and instructions can be found. At the web address, the user can fill out a detailed online questionnaire requesting information such as their name, address, email address, and the product being disposed of, number of items in the container, type of the electronic data storage device being shipped, whether the device shipped includes a battery, etc S2 and S3. At the web address the user can find detailed information and illustrations on how to remove a hard drive from different types of computers. The website may also include detailed instructions on how to print shipping label and the customer identifying label that will be affixed to the electronics disposal container including a walkthrough of the steps and information on how to set up the user's particular printer to properly print the labels. Such details can include specific instructions for the user's individual printer type and model S4.

Included with the electronic disposal container 1/201 is a shipping container 401 with a pre-addressed shipping label 402 attached. Alternatively, the shipping label 402

may be printed by the user and affixed to the shipping container. The shipping container label 402 and the electronics recycling device 1/201 should have matching bar codes on them for identification. When used, the purchaser will register their shipment of the electronics recycling device 1/201 to the recycler on-line at a secure website S2. Their registration number will be related to the bar code on their electronics recycling device 1/201. Also included inside the electronics disposal container is an identification label 501.

Once the user information is determined, the identification label 501 can be printed S3 (e.g., see Figure 13). Included on the identification label will be the shipping information and barcode. In addition, a visual identifier 503 can be included on the label. Such a visual identifier can include three randomly chosen symbols. Alternatively, the user can choose the symbols to be printed from a list or matrix S2a. The symbols are not particularly limited and may be, for instance, a sailboat, an omega and an ampersand. Of course, any number of visual identifier characters or kinds images may be used.

If a battery is being shipped, then the first symbol can identify the device as including a battery, for example, a battery symbol S3a. Identification of a battery is used so that the disposal facility knows that the electronics disposal container can be disposed of properly. For instance, instead of shredding an electronics disposal container 1/201 containing a battery, the electronics disposal container 1/201 containing the battery will be incinerated. Alternatively, other methods may be used to identify electronics recycling containers that contain batteries.

The identification labels 501 can then be placed on one or both of the front and back shells S5. The front and back shells may include a recessed portion 35, 235 onto

which the identification label 501 is to be placed to ensure a proper or uniform label location.

In one exemplary aspect, the customer would register his or her shipment with their customer information, and their email address S2b. The tracking number can be associated with a barcode on the device.

A shipping identification number used by the shipper is unique to the user and can be printed on both the shipping label and the identification label attached to the electronics disposal container to provide the shipping information and both can be easily scanned. In addition, if the shipping container were to be damage during transit, even if the electronics disposal container is separated from the shipping container, the shipping identification number printed on the identification label can be scanned to ensure the electronics disposal container is delivered.

A user can then place the electronics disposal container in the supplied shipping container. A printed shipping label is then placed on the shipping container. The user can then drop the shipping container off at the proper location for shipping S6.

During transit, the user can receive email updates when the product is received by the shipper, is in transit, and when received by the disposal facility S7.

The barcode on the shipping container can be read upon its receipt at the disposal facility S8. The barcode on the electronics recycling device can be read when the shipping package is opened under video surveillance S9.

Once inspected, a communication, such as an email, is sent to the user notifying them that their electronics disposal container was received by the disposal facility, either intact or that there was evidence of tampering S10.

If there is any evidence of tampering, then both the shipper and the user would be notified immediately that the electronic device was received in such manner that there was a possibility of tampering. In addition, the user can receive a copy of the video showing the inspection of the electronics recycling device.

If the electronic disposal container 1/201 shows evidence of tampering, then further manual processes will be employed S10a. If the package was received intact and there is no evidence of tampering, then the electronics disposal container can be stored in a secure location and under video/image surveillance until it is to be disposed of S11.

The electronic disposal container 1/201 is then processed for disposal S12. The electronics disposal container can be placed on a conveyor to the disposal device in a position so that the identification label can be scanned/read S13. Of course, the electronics disposal container can be identified using other methods, such as radio frequency identification chip, imaging of the visual identifier, etc. If the initial scan on the conveyer can positively relate the user identification label on the disposal container to the user's file in the database S13, the disposal container will proceed on the conveyer to the disposal device. At the end of the conveyor, the scanned electronics disposal container will have a picture taken of the identification label just before or as the electronics disposal container is being destroyed (e.g., going into the disposal device). An image of the electronics disposal container being disposed of may be transmitted to the user (e.g., emailed) S14.

In the event that the identification barcode cannot be read/scanned and positively related to a user in the database, the conveyer will stop, the electronics disposal container will be removed from the conveyer, and it will be processed with a non-automated

method S13a. Of course, the electronics disposal container can be removed from the conveyor in an automated fashion. The disposal device used can vary depending on the contents of the electronic disposal container 1/201. For instance, an electronic disposal container 1/201 containing a hard drive can be sent to a shredder and be shredded in a manner consistent with the applicable industry standards (e.g., NIST 800-88 and DOD 5220.32-M). If the electronic disposal container 1/201 contains a battery, it can be disposed of in an incinerator or other approved means. In addition, if the customer has a preference for disposal means, then the electronic disposal container 1/201 can be processed in the requested disposal manner.

The above system is applicable to any electronics disposal container. However, the multi-layer electronics disposal container can include other procedures. In the case of a multi-layer electronics disposal container 201, once the electronics disposal container 201 is acquired, the user can catalog the electronic data storage devices paced within it individually using their own system or software provided with the device. The details of the process can then be the same as those for the single unit described in Figure 12 or any variation to satisfy the user's needs.

As an alternative, any of the electronics disposal containers 1/201 can be sold individually and the end user can arrange their own disposal. This may be an attractive option for large companies who desire a secured shipping device. The company may then use their own systems for tracking or can use software provided with the purchase of the electronics disposal container for inventorying the contents of the disposal container and track its shipping to and destruction at the destruction facility.

While exemplary embodiments of the invention have been described in view of electronic data storage devices, it is possible to store any type of device for which security is required within the disposal container such as documents, or other physical articles which need to be transported in a secure manner.

While the invention has been described using exemplary components, any similar component can be used. For instance, the shaft of the male portion of the locking mechanism and the shape of the female portion of the locking mechanism may be circular or square, the front shells and trays may be of any shape or size, and the locking mechanism can be of some other form, without departing from the teachings and sprit of the invention.

While the invention has been described in terms of exemplary embodiments, those skilled in the art will recognize that the invention can be practiced with modification within the spirit and scope of the appended claims.

Further, it is noted that, Applicant's intent is to encompass equivalents of all claim elements, even if amended later during prosecution.

CLAIMS

What is claimed is:

1. A storage device comprising:

a front shell including a locking mechanism; and

a back shell including a locking mechanism complementary to the locking mechanism of the front shell and configured such that, once engaged with the locking mechanism of the front shell, a cavity formed between the front shell and the back shell is closed and the front shell and the back shell cannot be separated without damaging the storage device.

2. The storage device according to claim 1, further comprising an intermediate tray having a locking mechanism complementary to each of the locking mechanism of the front shell and the locking mechanism of the back shell such the locking mechanism of the front shell is configured to lock to the locking mechanism of the intermediate tray and the locking mechanism of the back shell is configured so as to lock with the locking mechanism of the intermediate tray.

3. The storage device according to claim 1, further comprising a plurality of intermediate trays configured such that a locking mechanism of one of the plurality of intermediate trays interlocks with the locking mechanism of one of the locking mechanism of the front shell and the locking mechanism of the back shell.

4. The storage device according to claim 1, wherein the locking mechanism of the front shell includes a male locking pin and the complementary locking mechanism of the back shell includes a female slot.

5. The storage device according to claim 4, wherein the male locking pin includes:

a shaft extending from the front shell; and

a tapered head on a distal end of the shaft opposite the front shell,

wherein the tapered head includes a step portion where the shaft and the tapered head meet so as to form a ridge, and

wherein the female locking slot includes:

a small width portion formed in base shell into which the male locking pin can enter, the small width portion having a width less than a width of the tapered head and a length less than a length of the shaft; and

a large width portion having a width greater than or equal to a width of the shaft, and

wherein the female locking slot includes a slit in an axial direction thereof so as to allow walls of the female locking slot to flex away from each other when the tapered head is inserted into the small width portion.

6. The storage device according to claim 1,

wherein the front shell includes a base and side walls around a perimeter of the base,

wherein the back shell includes a base and side walls around a perimeter of the base, and

wherein the storage device further comprises:

lips extending from a portion of the side walls of the front shell away from the base portion; and

lips extending from a portion of the side walls of the back shell away from the base portion such that, when the front shell and the back shell are aligned to lock together, the lips of the front shell alternate around a perimeter of the side walls of the back shell.

7. The storage device according to claim 6, wherein the lips of the front shell overlap a portion of the side walls of the back shell and the lips of the back shell overlap a portion of the side walls of the front shell.

8. The storage device according to claim 7, wherein the lips of the front shell are disposed in recesses of the side walls of the back shell.

9. The storage device according to claim 4, further comprising:

an intermediate tray including a male locking pin complementary to the female locking slot of the back shell and a female locking slot complementary to the male locking pin of the front shell such that the male locking pin of the front shell is configured to lock to the female locking slot of the intermediate tray and female locking

slot the back shell is configured so as to lock with male locking pin of the intermediate tray.

10. The storage device according to claim 4, further comprising:

a male alignment pin formed on the back shell adjacent to the female locking slot, and

a female alignment slot formed on the front shell adjacent to the male locking pin so as to be complementary to the male alignment pin.

11. The storage device according to claim 3, wherein the plurality of intermediate trays are configured such that a locking mechanism of one of the plurality of intermediate trays interlocks with a locking mechanism of an other of the plurality of intermediate trays.

12. The storage device according to claim 4, wherein the male locking pin includes:

a shaft extending from the front shell; and

a tapered head on a distal end of the shaft opposite the front shell, the tapered head including a split portion,

wherein the tapered head includes a step portion where the shaft and the tapered head meet so as to form a ridge, and

wherein the female locking slot includes:

a small width portion formed in base shell into which the male locking pin can enter, the small width portion having a width less than a width of the tapered head and a length less than a length of the shaft; and

a large width portion having a width greater than or equal to a width of the shaft.

wherein split portion of the tapered head is configured such that, when the tapered head is inserted into the narrower width portion of the female locking slot, sides of the tapered head flex inward, and, when the tapered head is inserted past the narrower width portion of the female locking slot, the sides of the tapered head flex outward so as to engage the female locking slot.

13. A method of disposing of an electronic data storage device, the method comprising:

providing to a user a disposal container having a front shell and a back shell which include a locking mechanism configured so that once engaged the front and back shell can not be separated without damage to the disposal container, the disposal container including a chamber within which is closed when the front and back shell are engaged together;

placing an electronic data storage device into the chamber;

joining the front shell to the back shell so as to engage the locking mechanism;

transporting the disposal container to a disposal location; and

disposing of the disposal container and the electronic data storage device therein without opening the disposal container.

14. The method according to claim 13 comprising:

applying a random or user-generated visual identification to the disposal container prior to the transporting;

capturing an image of the visual identification during the disposing of the disposal container; and

sending the image to the user.

15. The method according to 14, wherein the disposal container is formed of recyclable material.

16. The method according to claim 15, wherein the disposing of the disposal container and the electronic data storage device comprises shredding, incineration, or other destruction process to destroy the disposal container and the electronic device simultaneously.

17. The method according to claim 13, further comprising:

applying an identification barcode to the disposable container;

applying a shipping label to a shipping container and placing the disposable container in the shipping container;

after the transporting, comparing the identification barcode and the shipping label to ensure the identification barcode is a match with the shipping label; and

relating the shipping container and the disposal container to each other and to the user.

18. The method according to claim 13, further comprising:

connecting an intermediate tray to one of the front shell and the back shell; and

joining an other of the front shell and the back shell to the intermediate tray.

19. The method according to claim 13,

disposing a plurality of intermediate trays between the front shell and the back shell such that the front shell locks with an adjacent intermediate tray of the plurality of intermediate trays, and the back shell locks with an other intermediate tray between the intermediate tray adjacent the front shell and the back shell; and

locking at least two of the plurality of intermediate trays disposed between the front shell and the back shell to each other.

20. A non-transitory programmable storage medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform a method, the method comprising:

assigning an identification number to a disposal container, the disposal container including a chamber for storing the article and configured such that once closed the disposal container cannot be opened without damage;

receiving registration information on the article including contact information from a user;

receiving tracking information during transit of the disposal container from the user to a disposal facility;

communicating the tracking information to the user;

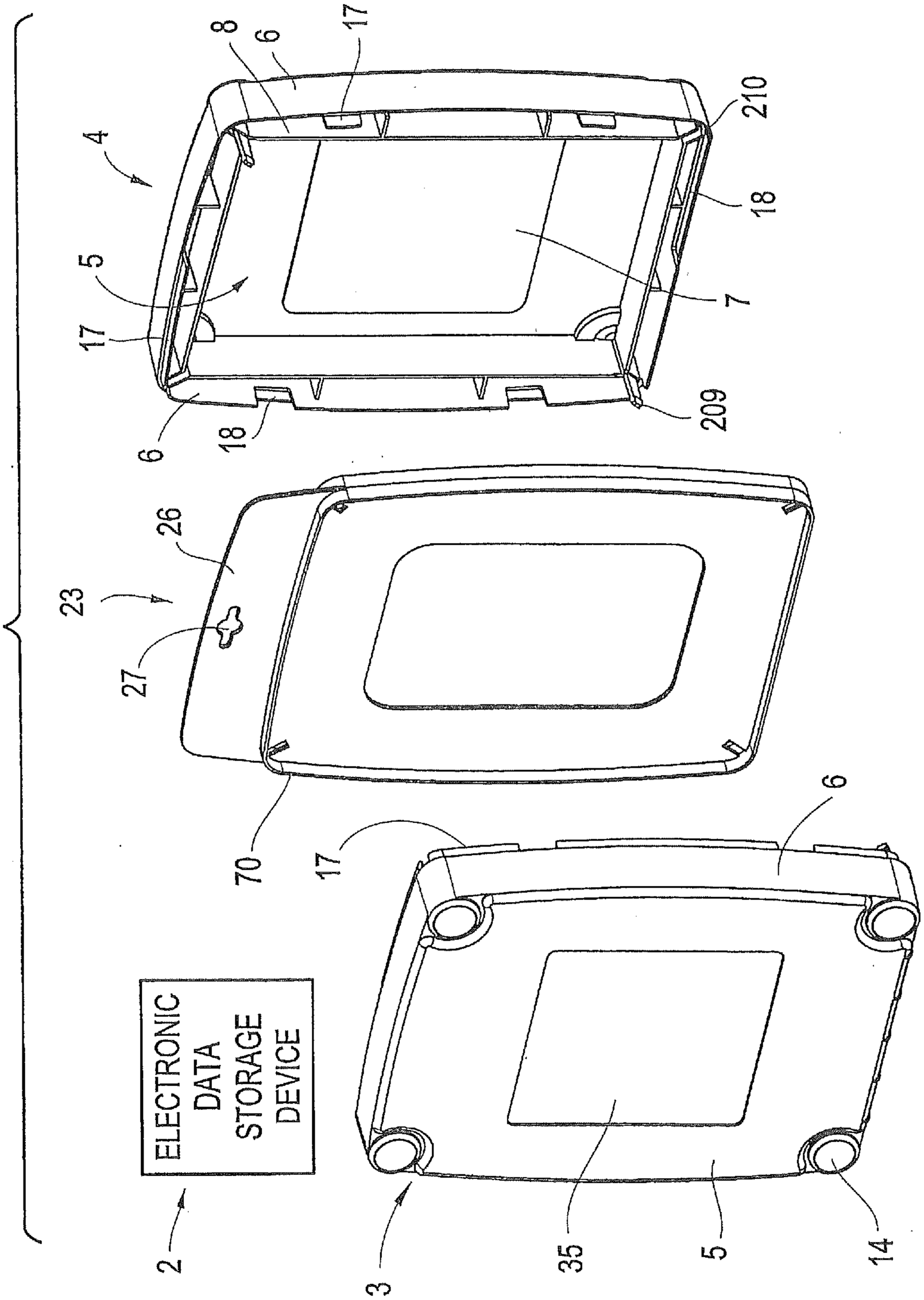
recording images of an inspection of the disposal container during receipt at the disposal facility;

communicating the images of the inspection to the user;

recording an image of the disposal container as it is being destroyed; and

communicating the image of the disposal container as it is being destroyed to the user.

FIG.1a


8
6
17
4
210
18
5
17
7
6
18
209
26
23
27
70
17
6
ELECTRONIC DATA STORAGE DEVICE
2
3
35
5
14

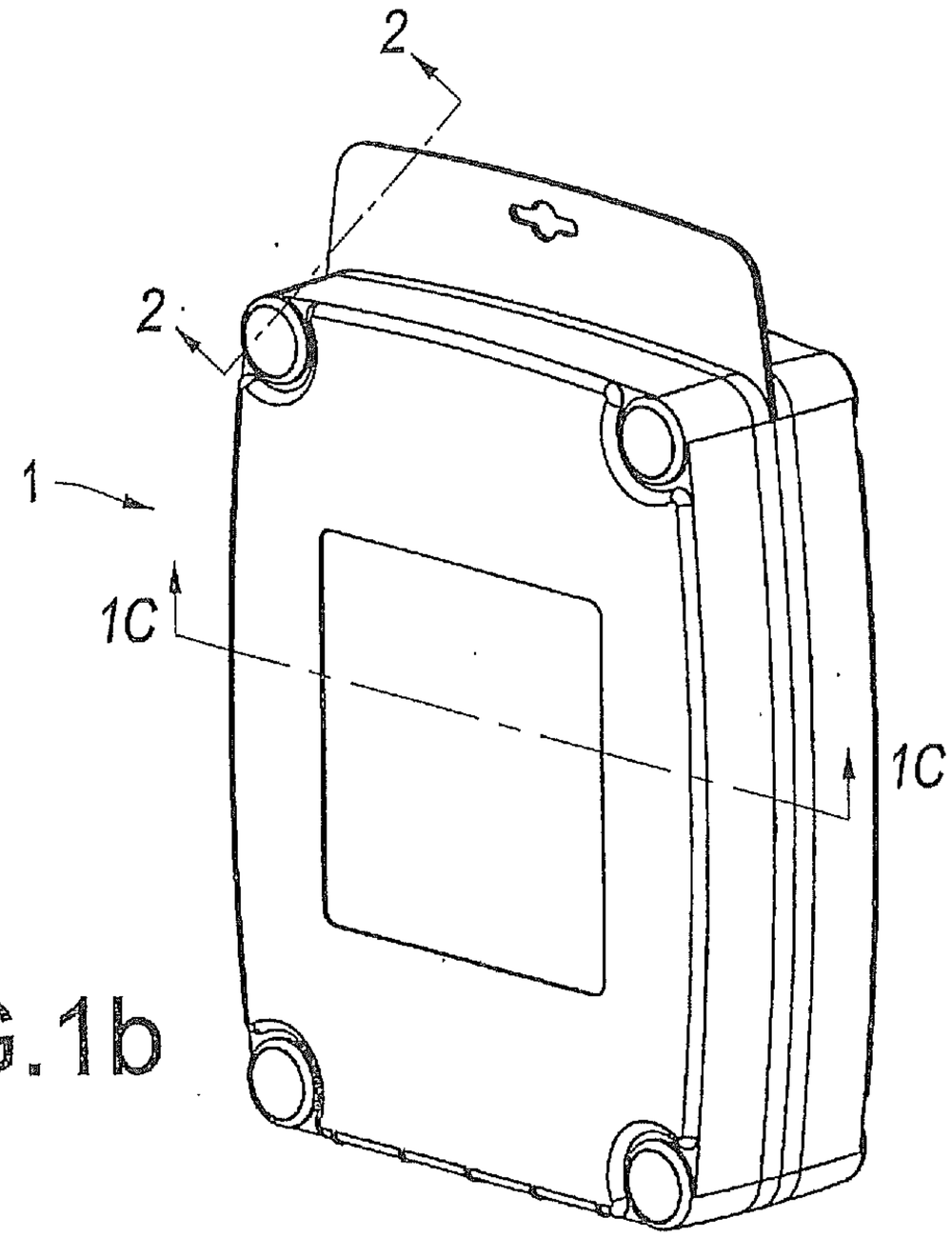


FIG.1b

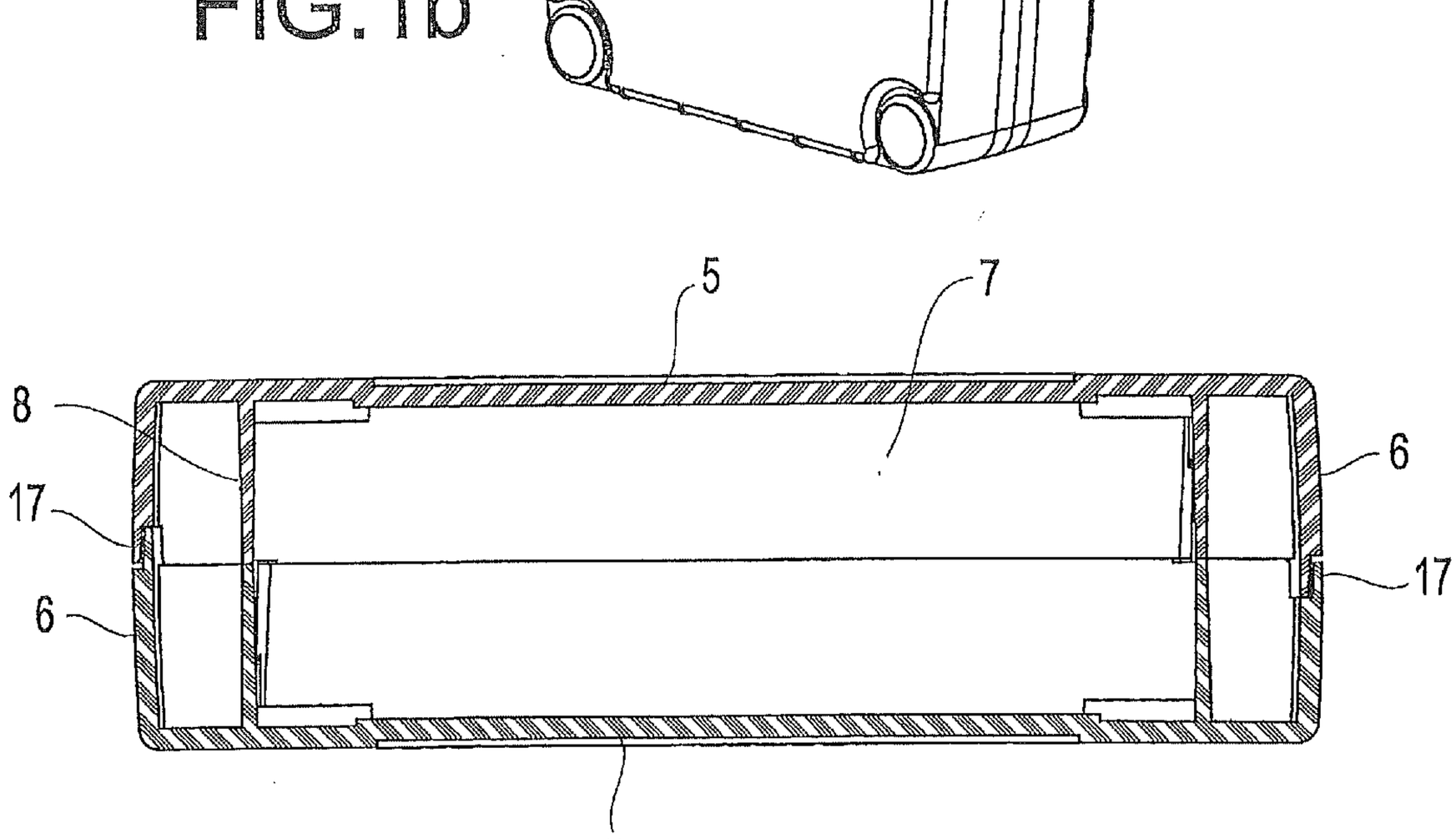
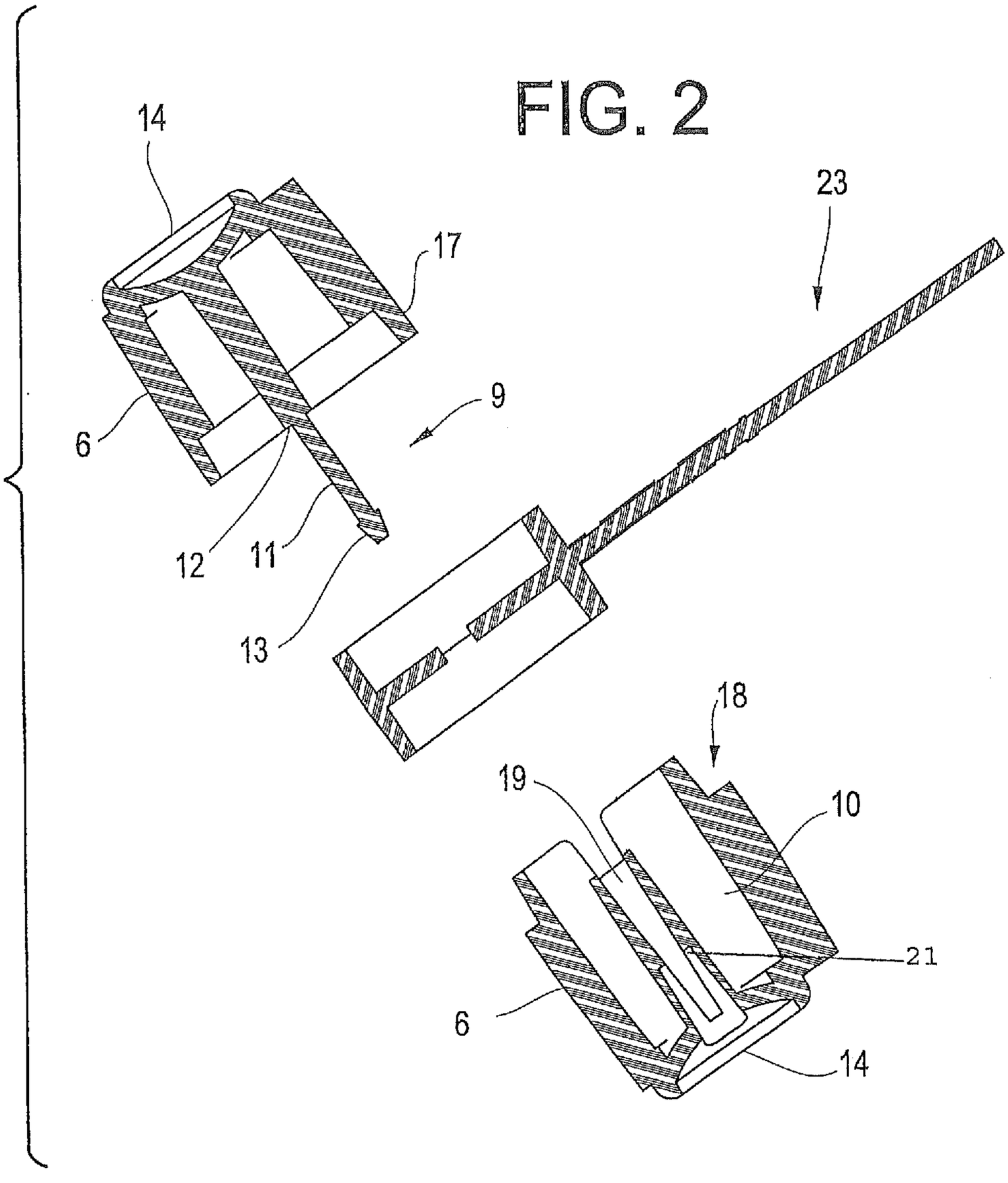


FIG.1c

FIG. 2



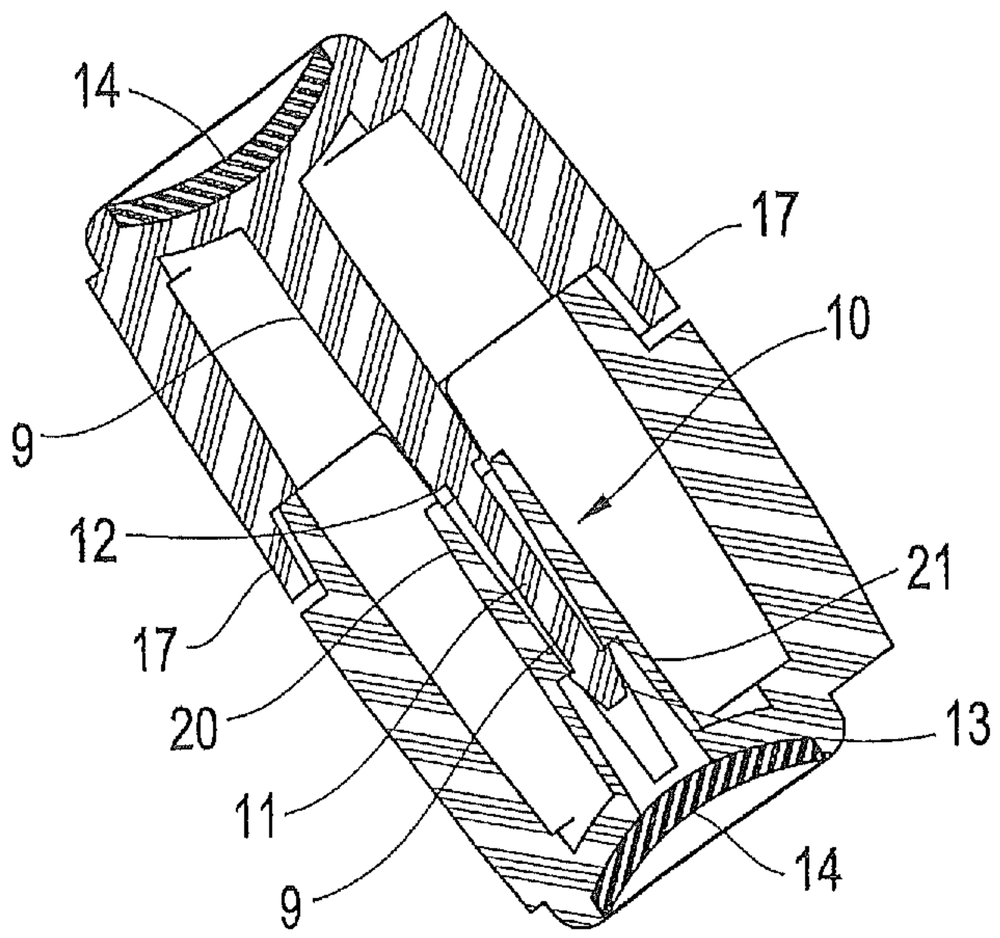


FIG.3

FIG.4a

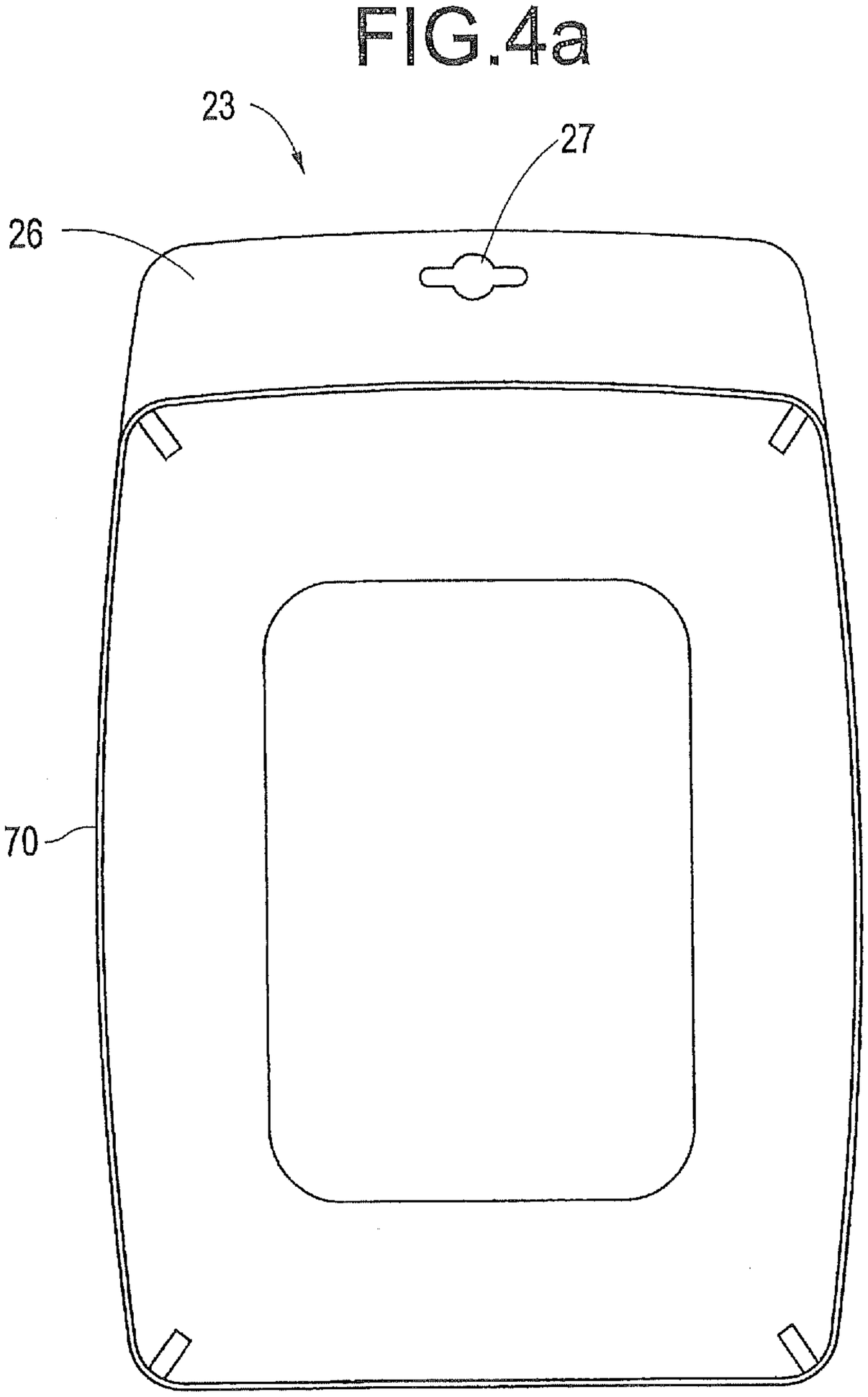


FIG.4b

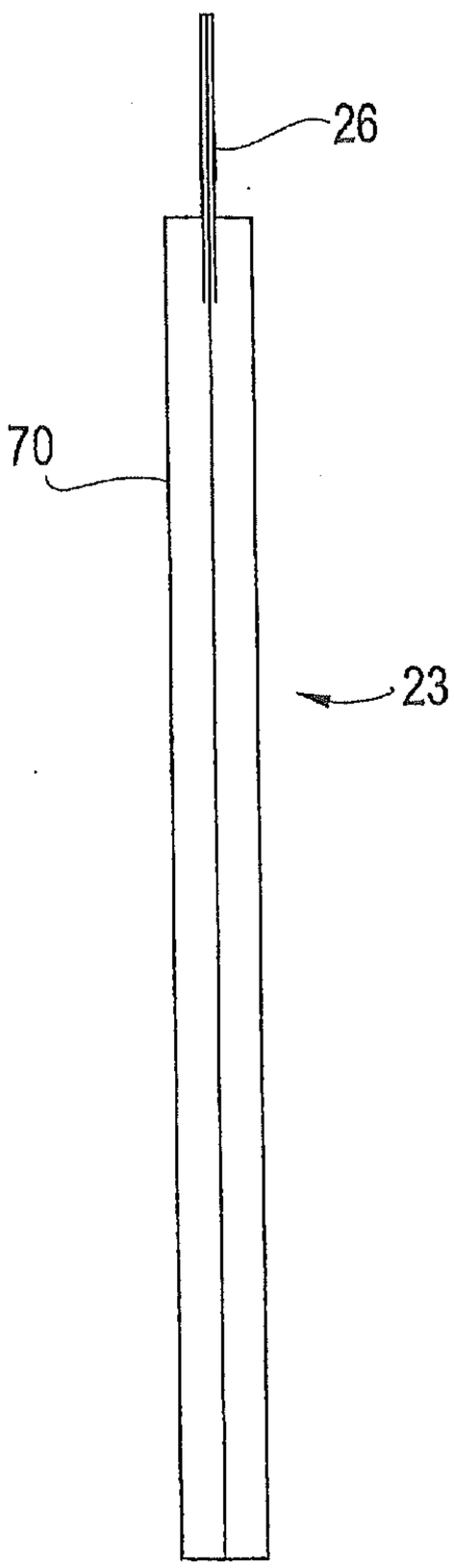


FIG.5

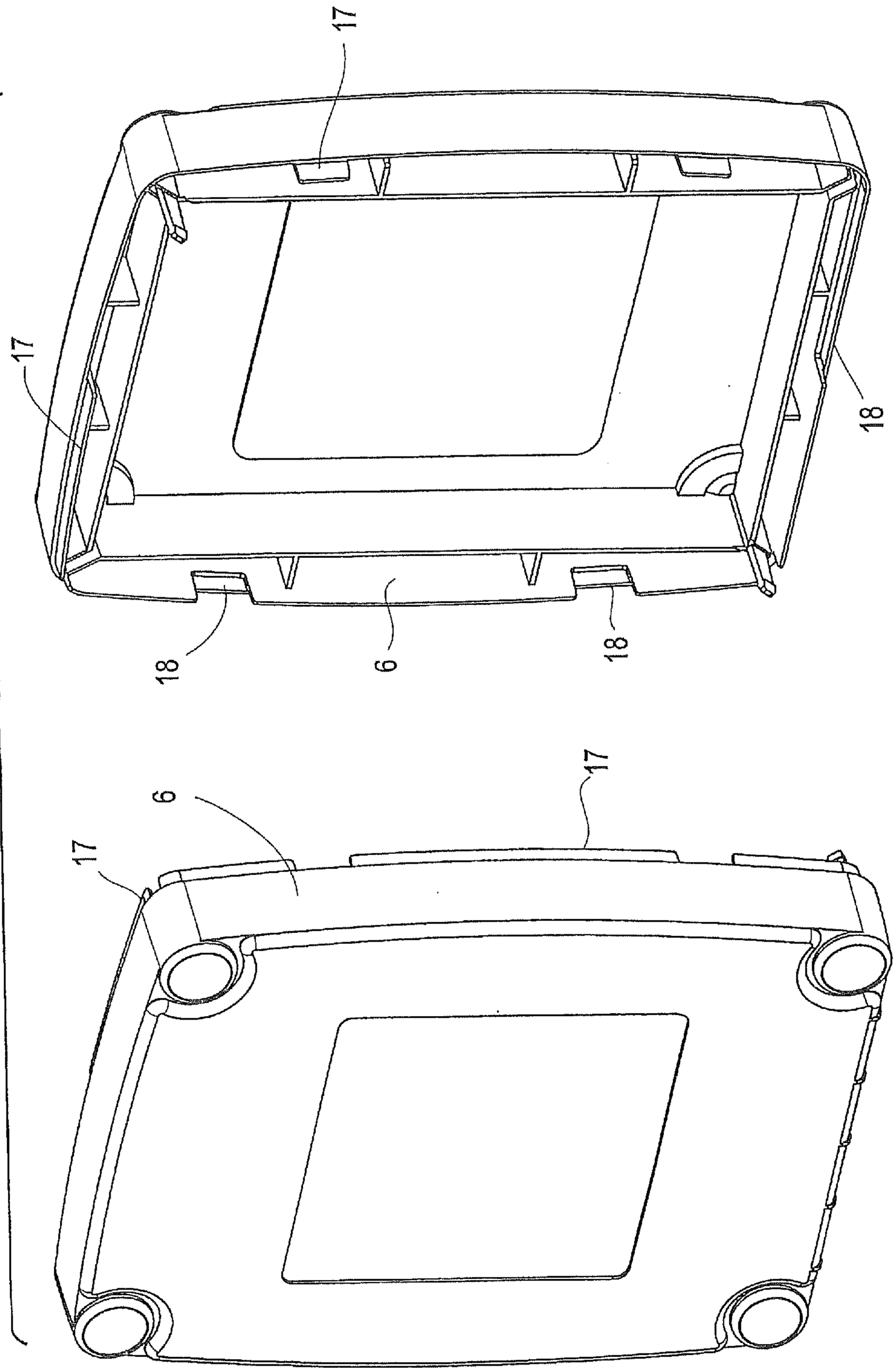


FIG. 6a

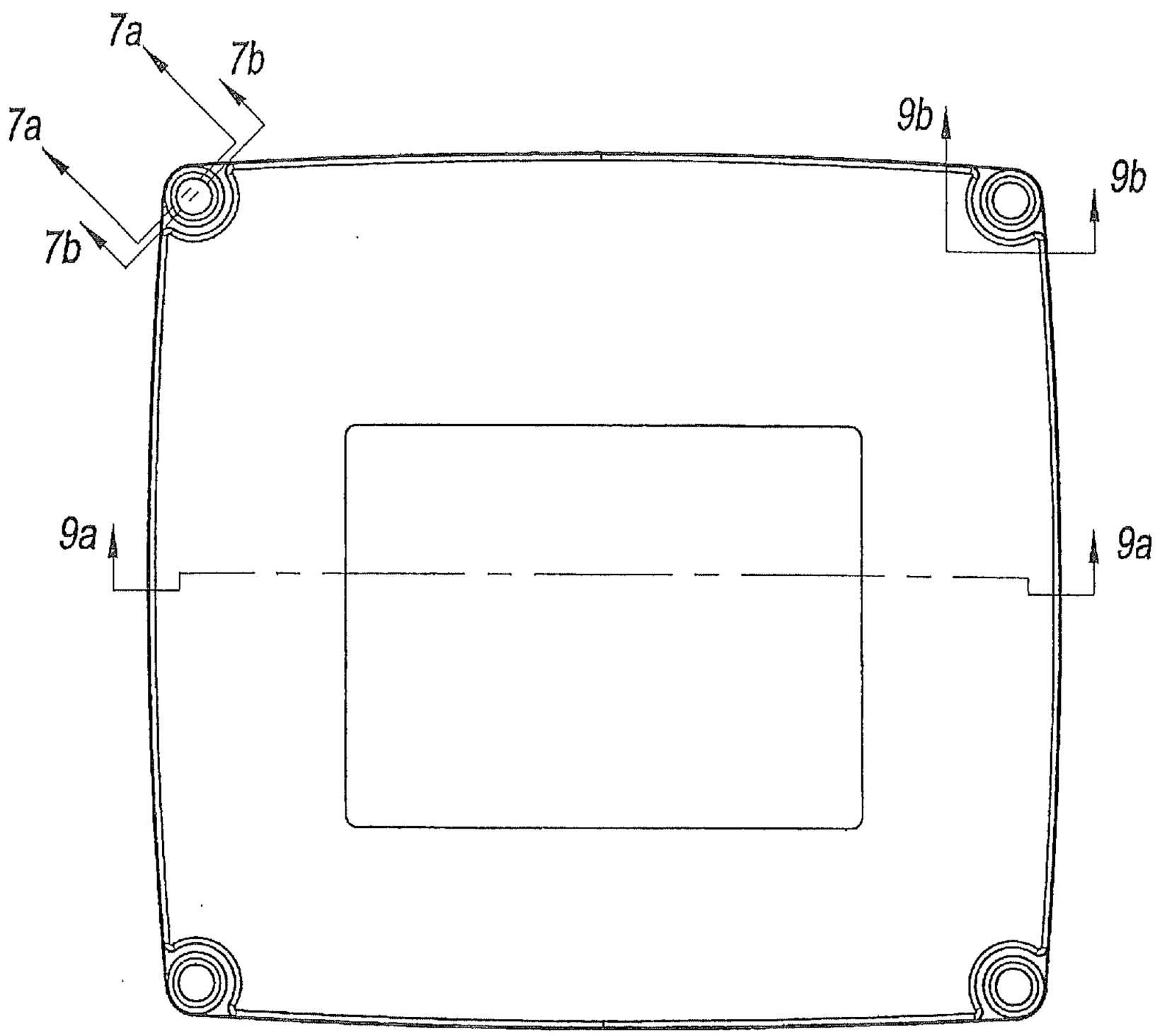


FIG. 6b

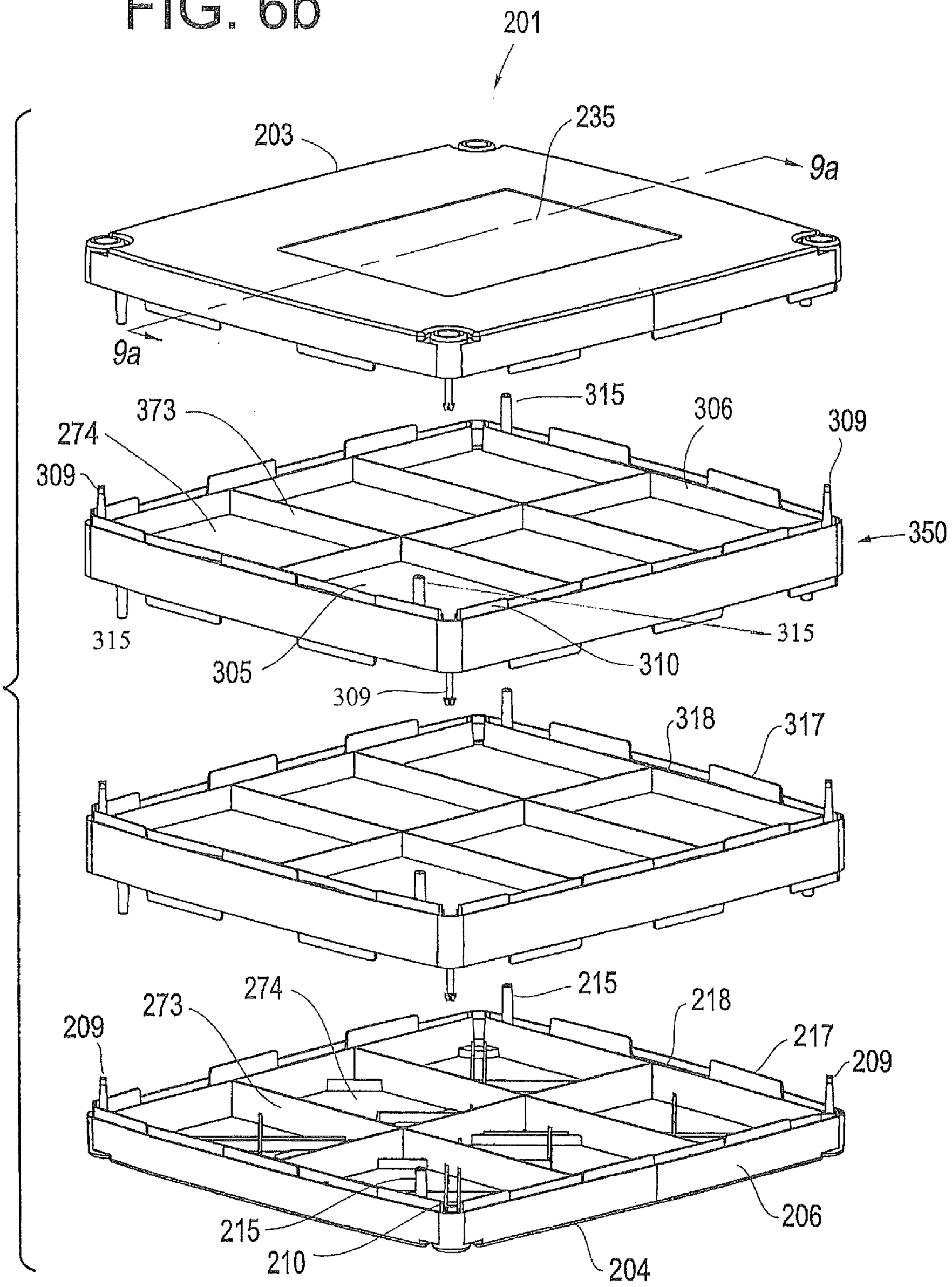

201
203
235
9a
9a
315
373
274
306
309
309
350
315
315
305
310
309
318
317
215
274
218
273
217
209
209
206
215
210
204

FIG. 7a

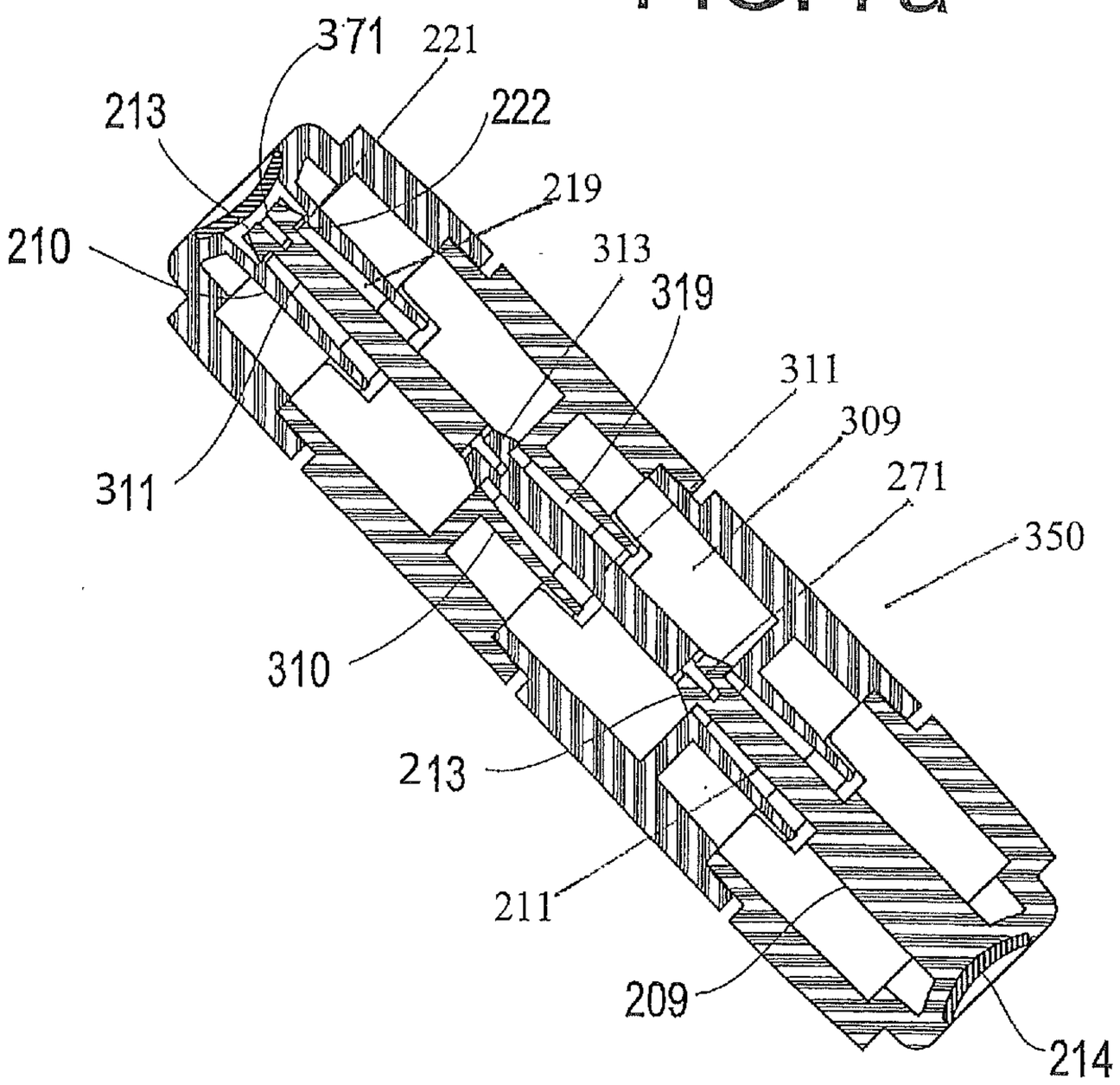
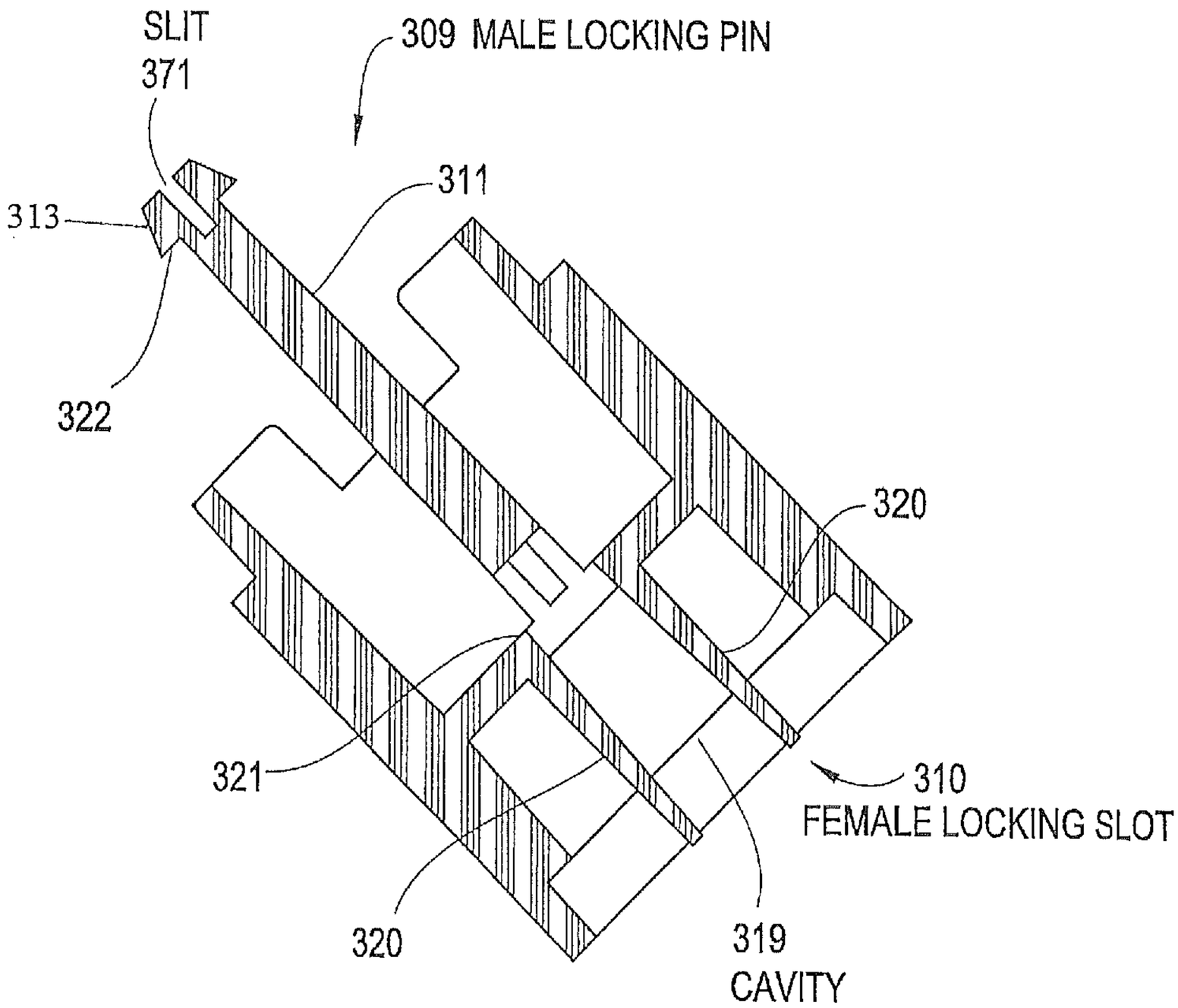

371
221
213
222
219
210
313
319
311
309
271
350
310
213
211
209
214

FIG. 7b


SLIT
371
309 MALE LOCKING PIN
311
313
322
320
321
310
FEMALE LOCKING SLOT
320
319
CAVITY

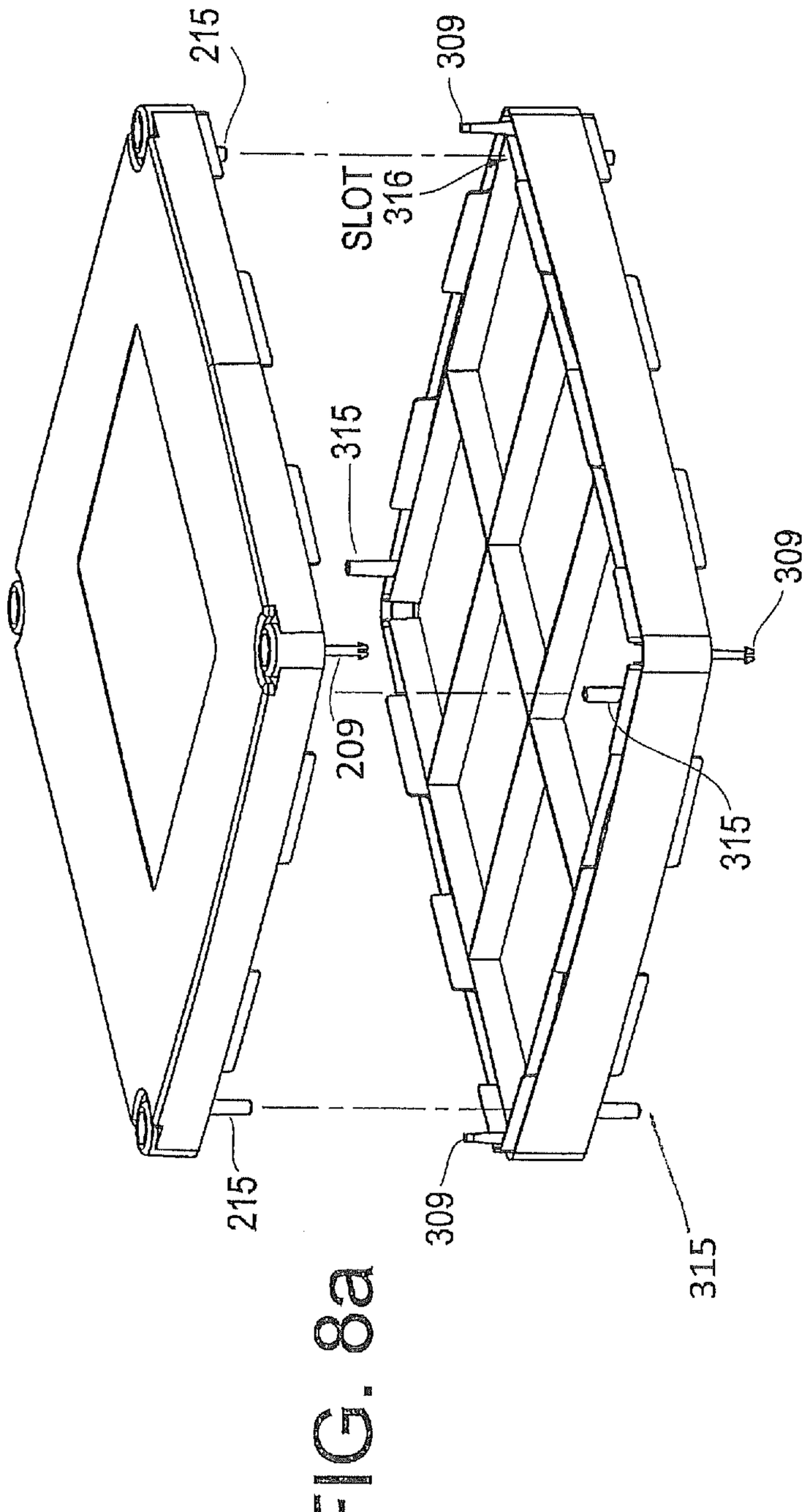


FIG. 8a

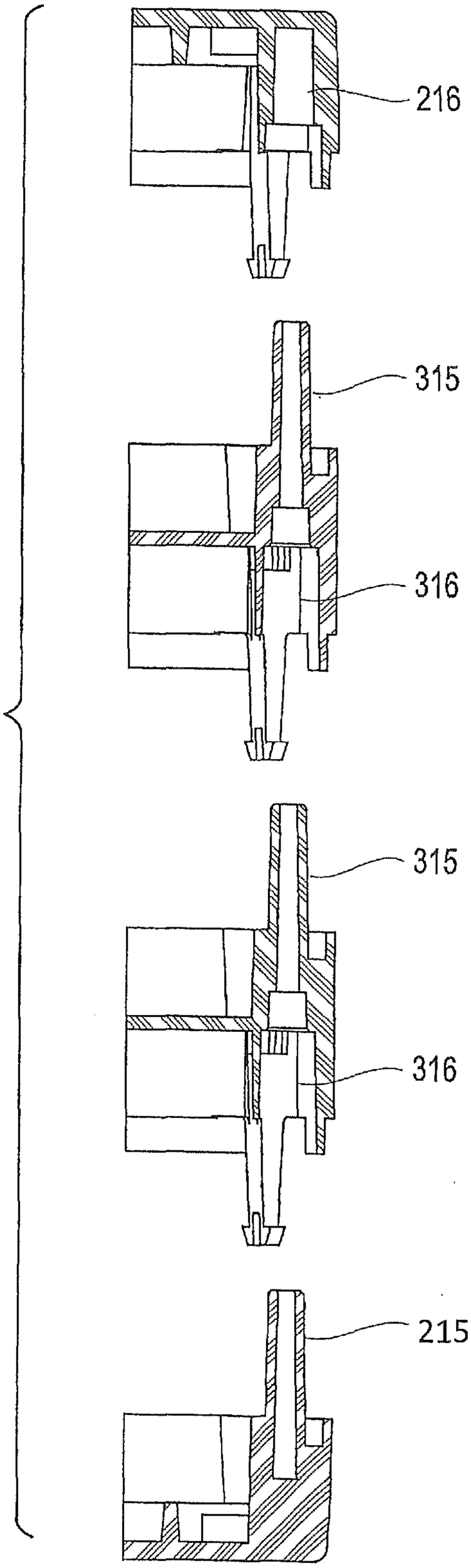


FIG. 8b

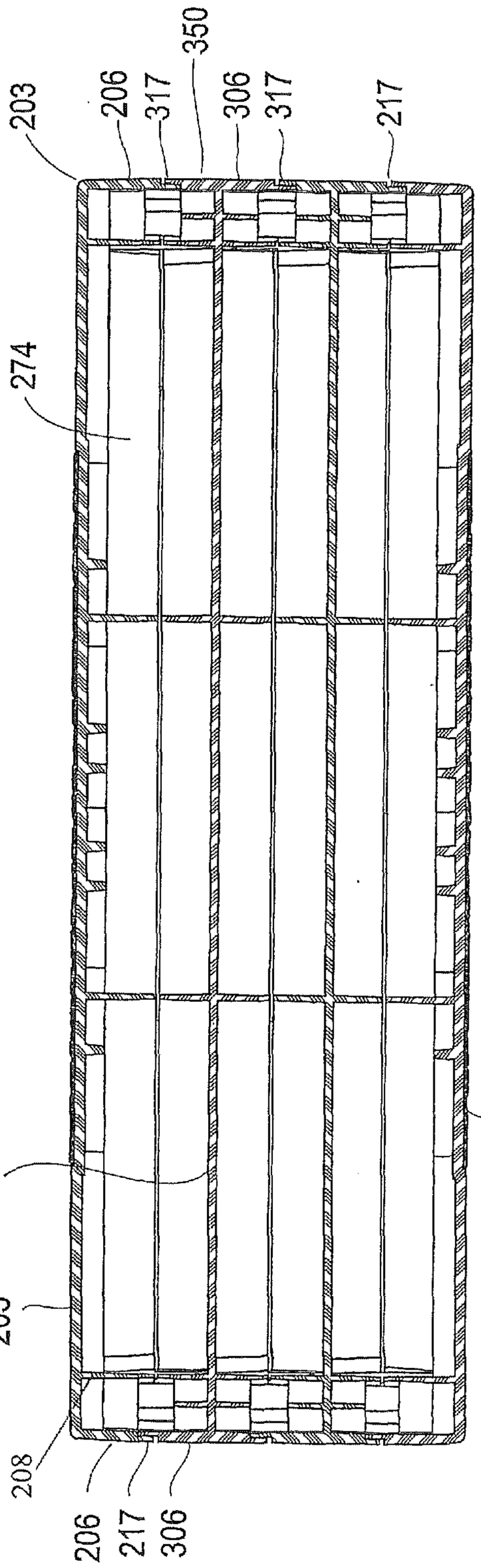

203
206
317
350
306
317
217
274
305
205
204
208
206
217
306

FIG. 9a

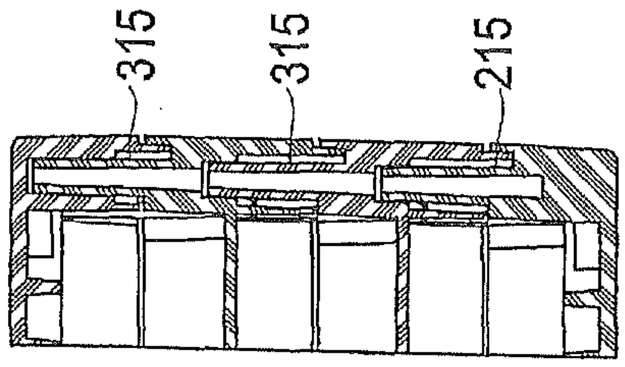

315
315
215

FIG. 9b

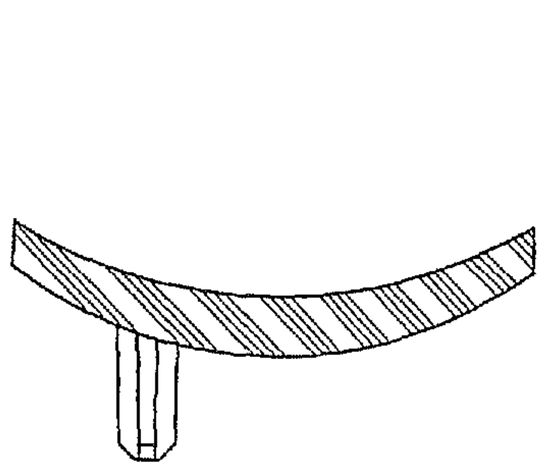


FIG. 10c

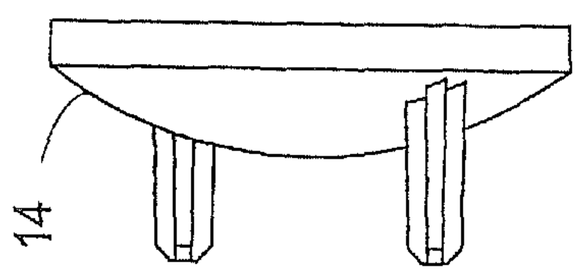


FIG. 10b

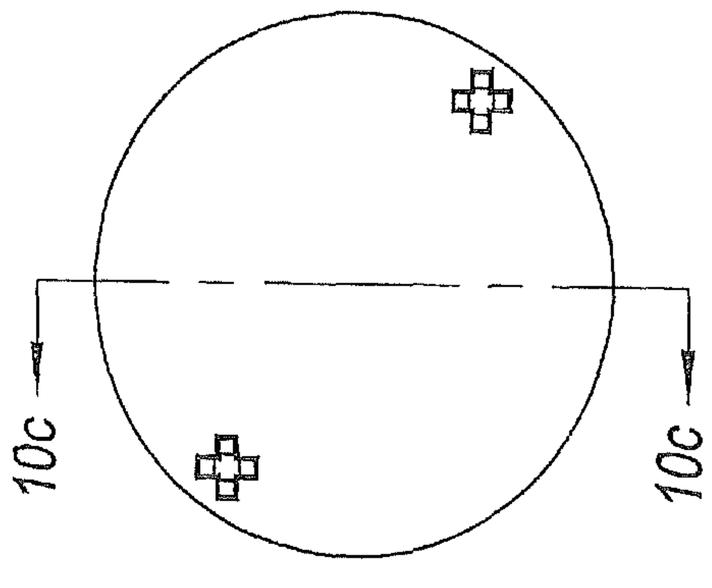


FIG. 10a

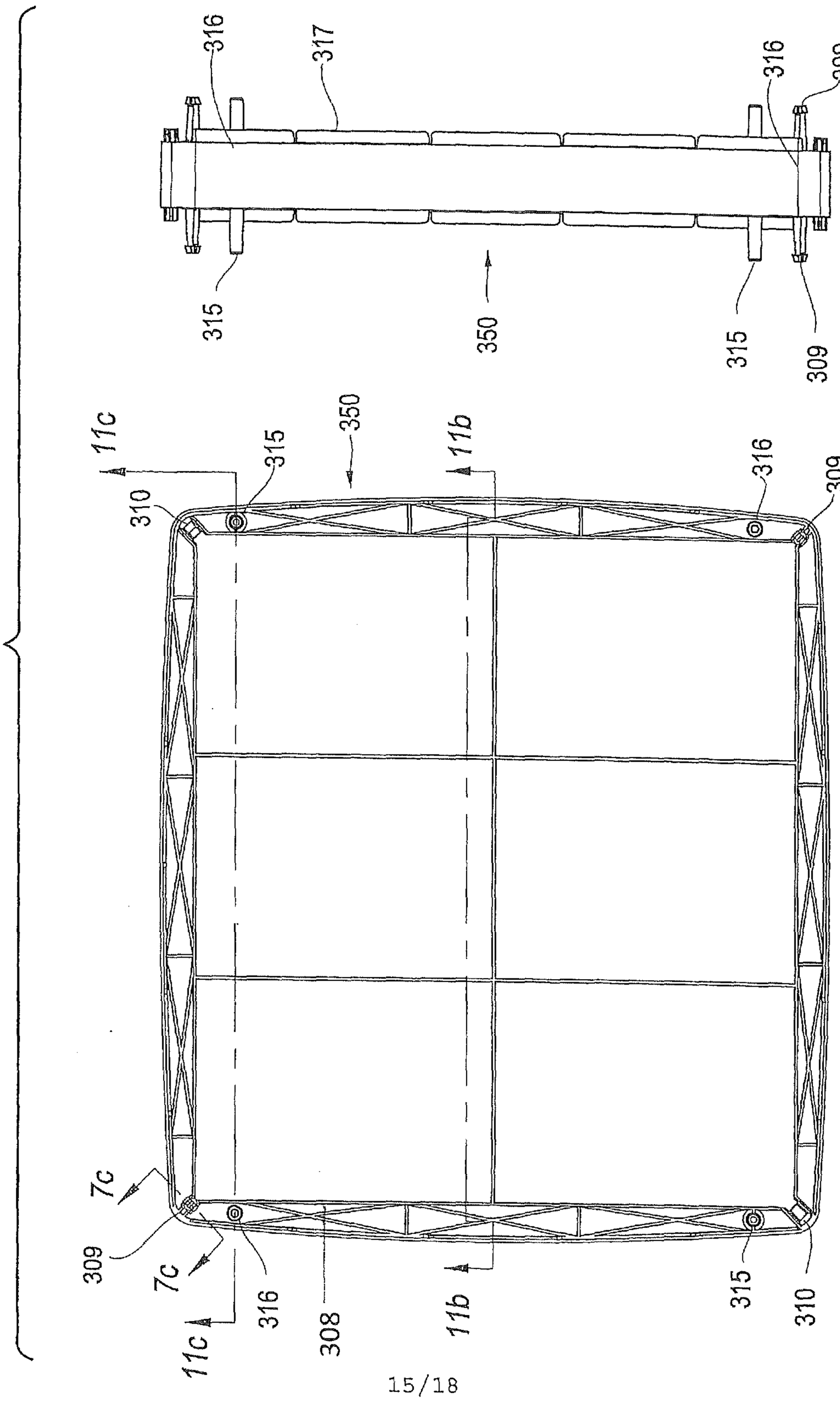

316
317
315
350
315
309
316
309
11c
315
350
11b
310
316
309
7c
309
7c
11c
316
308
11b
315
310

FIG.11a

FIG. 11b

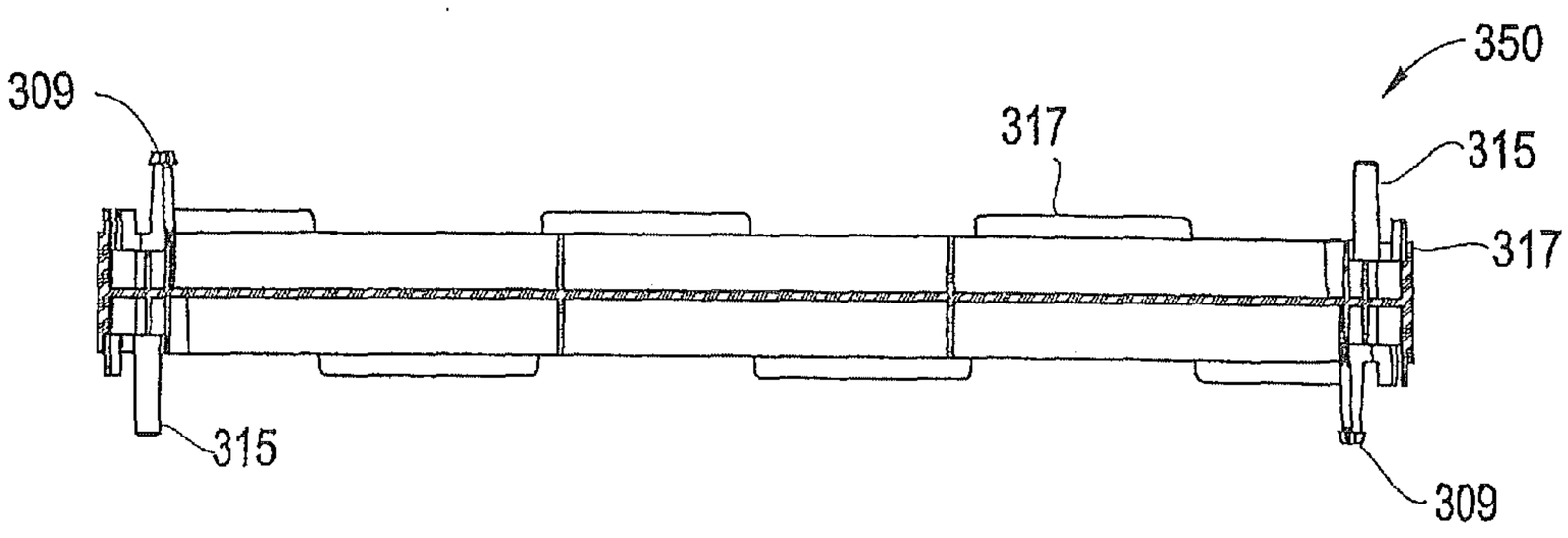
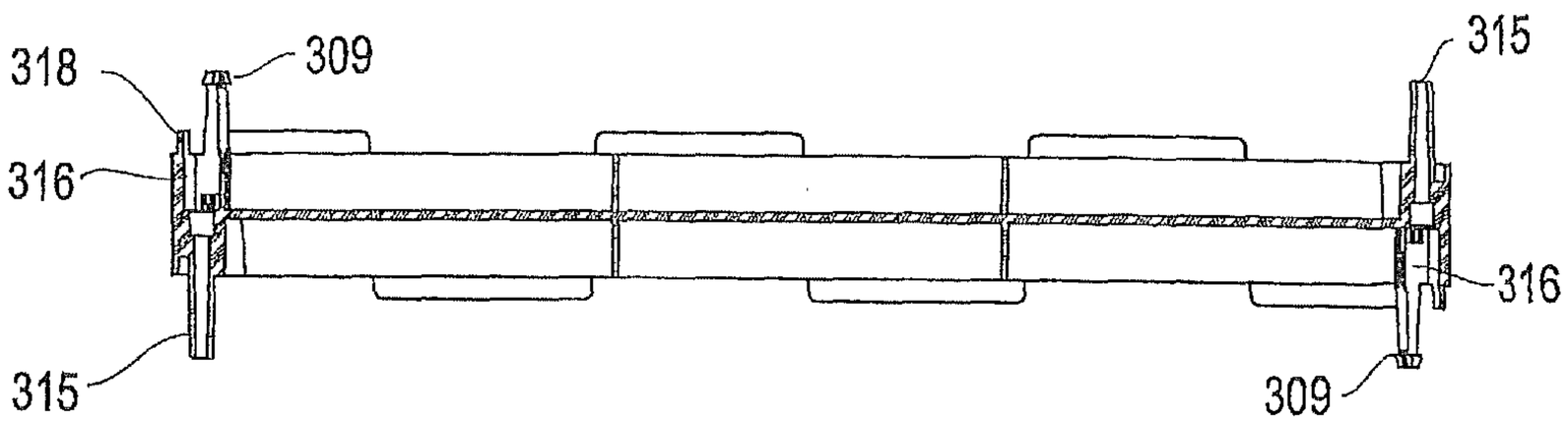


FIG. 11c



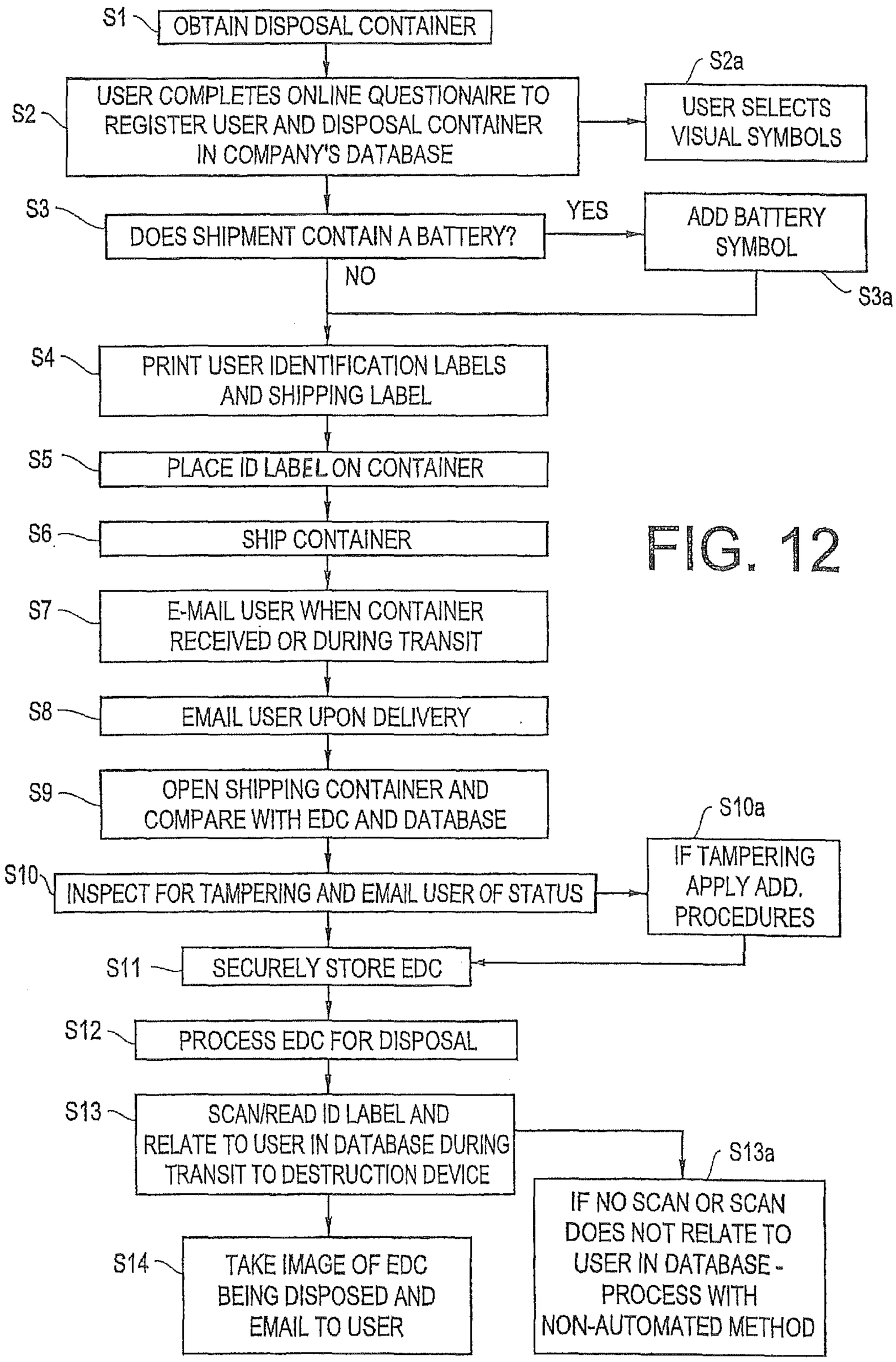

S1
OBTAIN DISPOSAL CONTAINER
S2
USER COMPLETES ONLINE QUESTIONAIRE TO REGISTER USER AND DISPOSAL CONTAINER IN COMPANY'S DATABASE
S2a
USER SELECTS VISUAL SYMBOLS
S3
DOES SHIPMENT CONTAIN A BATTERY?
YES
ADD BATTERY SYMBOL
S3a
NO
S4
PRINT USER IDENTIFICATION LABELS AND SHIPPING LABEL
S5
PLACE ID LABEL ON CONTAINER
S6
SHIP CONTAINER
S7
E-MAIL USER WHEN CONTAINER RECEIVED OR DURING TRANSIT
S8
EMAIL USER UPON DELIVERY
S9
OPEN SHIPPING CONTAINER AND COMPARE WITH EDC AND DATABASE
S10
INSPECT FOR TAMPERING AND EMAIL USER OF STATUS
S10a
IF TAMPERING APPLY ADD. PROCEDURES
S11
SECURELY STORE EDC
S12
PROCESS EDC FOR DISPOSAL
S13
SCAN/READ ID LABEL AND RELATE TO USER IN DATABASE DURING TRANSIT TO DESTRUCTION DEVICE
S13a
IF NO SCAN OR SCAN DOES NOT RELATE TO USER IN DATABASE - PROCESS WITH NON-AUTOMATED METHOD
S14
TAKE IMAGE OF EDC BEING DISPOSED AND EMAIL TO USER

FIG. 12

FIG. 13a

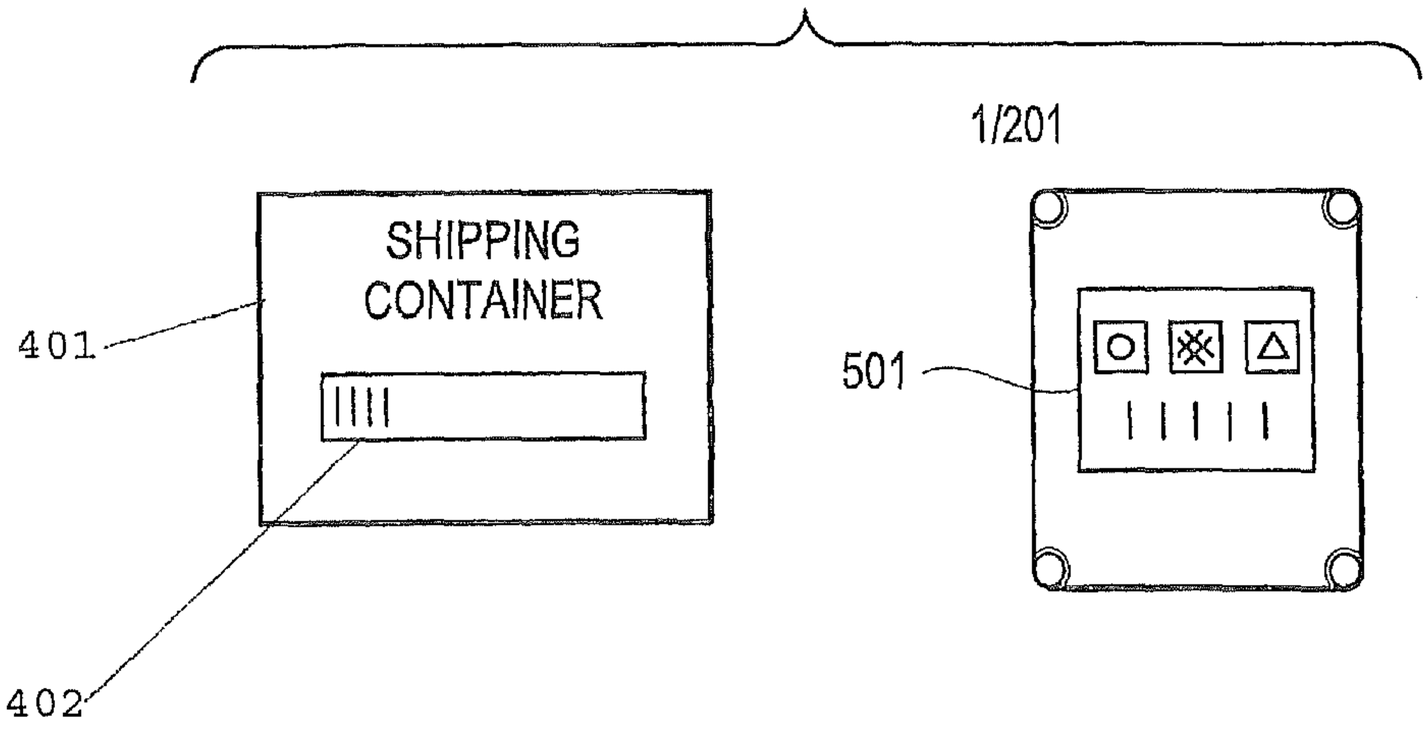


FIG. 13b

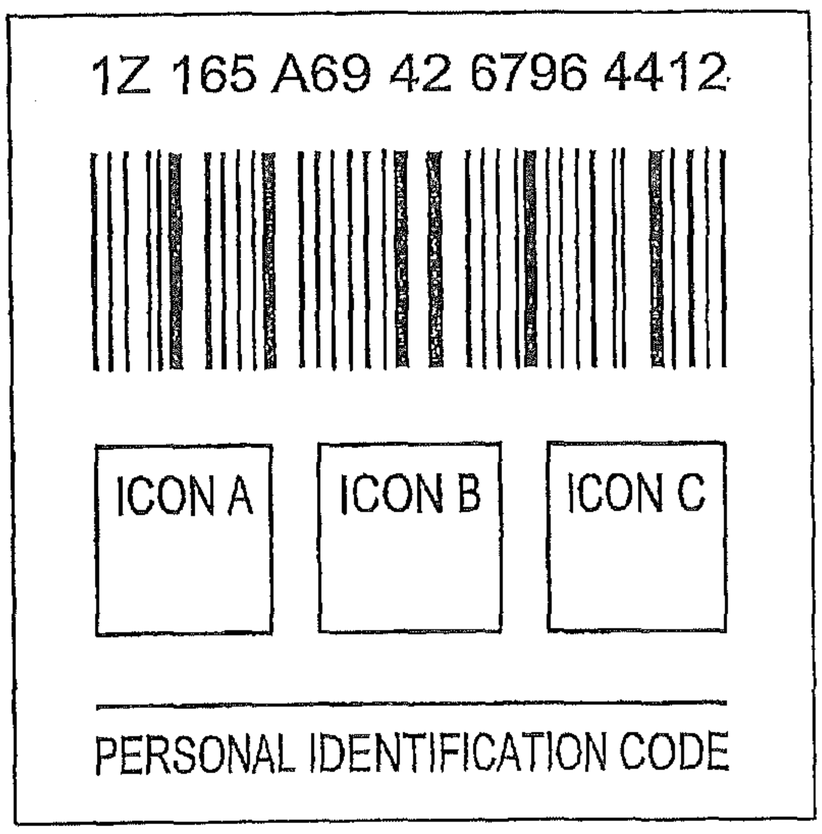
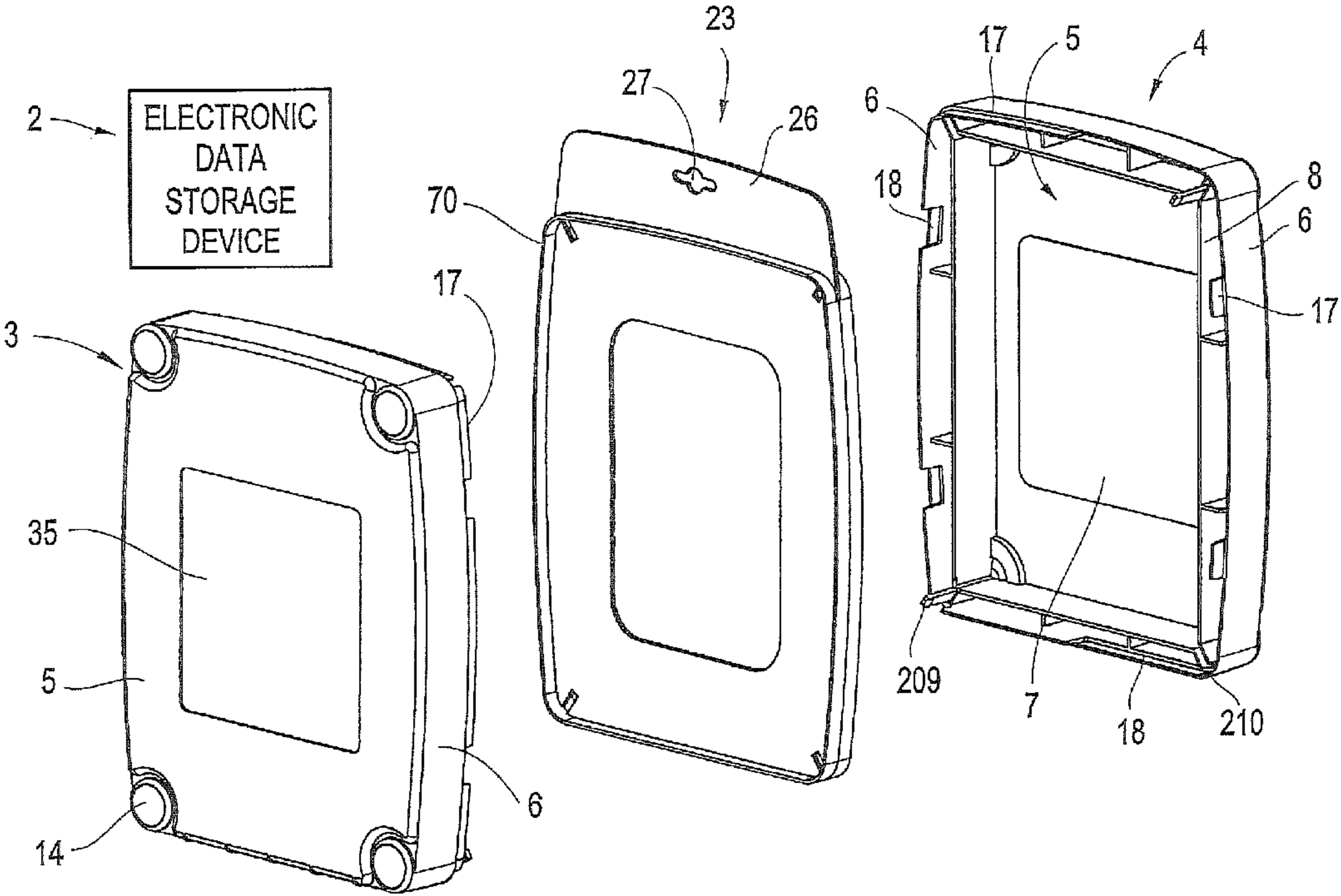


FIG.1a


2
ELECTRONIC DATA STORAGE DEVICE
3
17
35
5
14
6
23
27
26
70
17
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4
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18
8
6
17
209
7
18
210