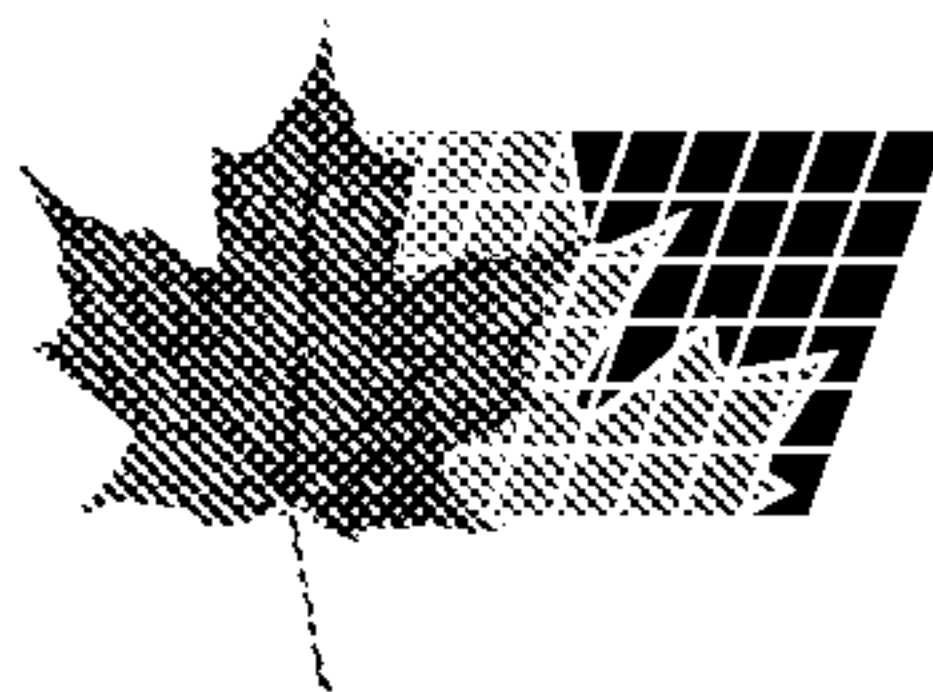




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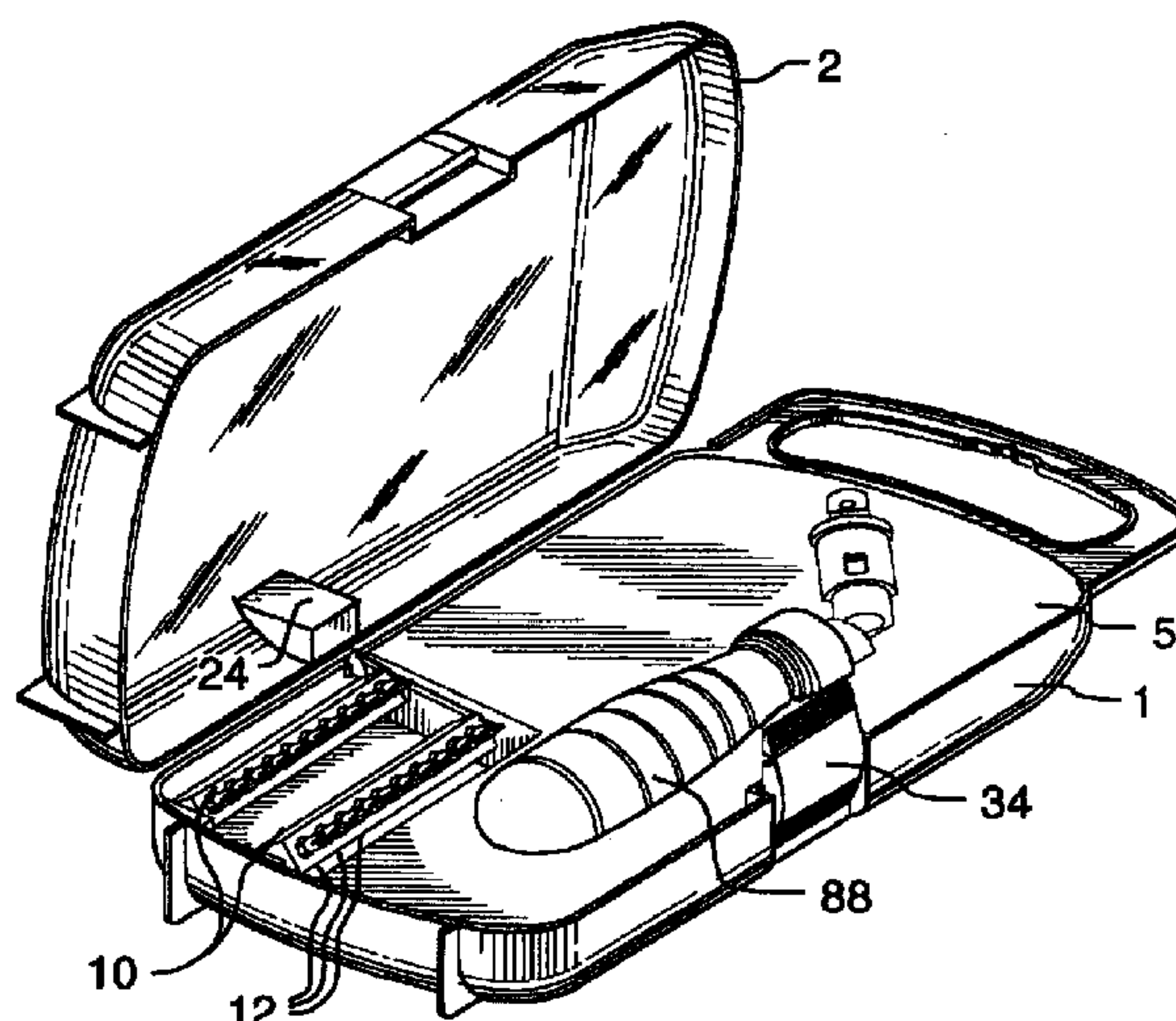
(30) 1997/08/08 (60/054,935) US

(30) 1997/11/26 (08/979,879) US

(30) 1998/03/10 (60/077,470) US

(54) **COFFRET A OUTILS ET COMPARTIMENTS A OUTILS A
PORTE-ELEMENTS PIVOTANT**

(54) **TOOLBOXES AND TOOL CASES WITH PIVOTABLE
COMPONENT HOLDER**



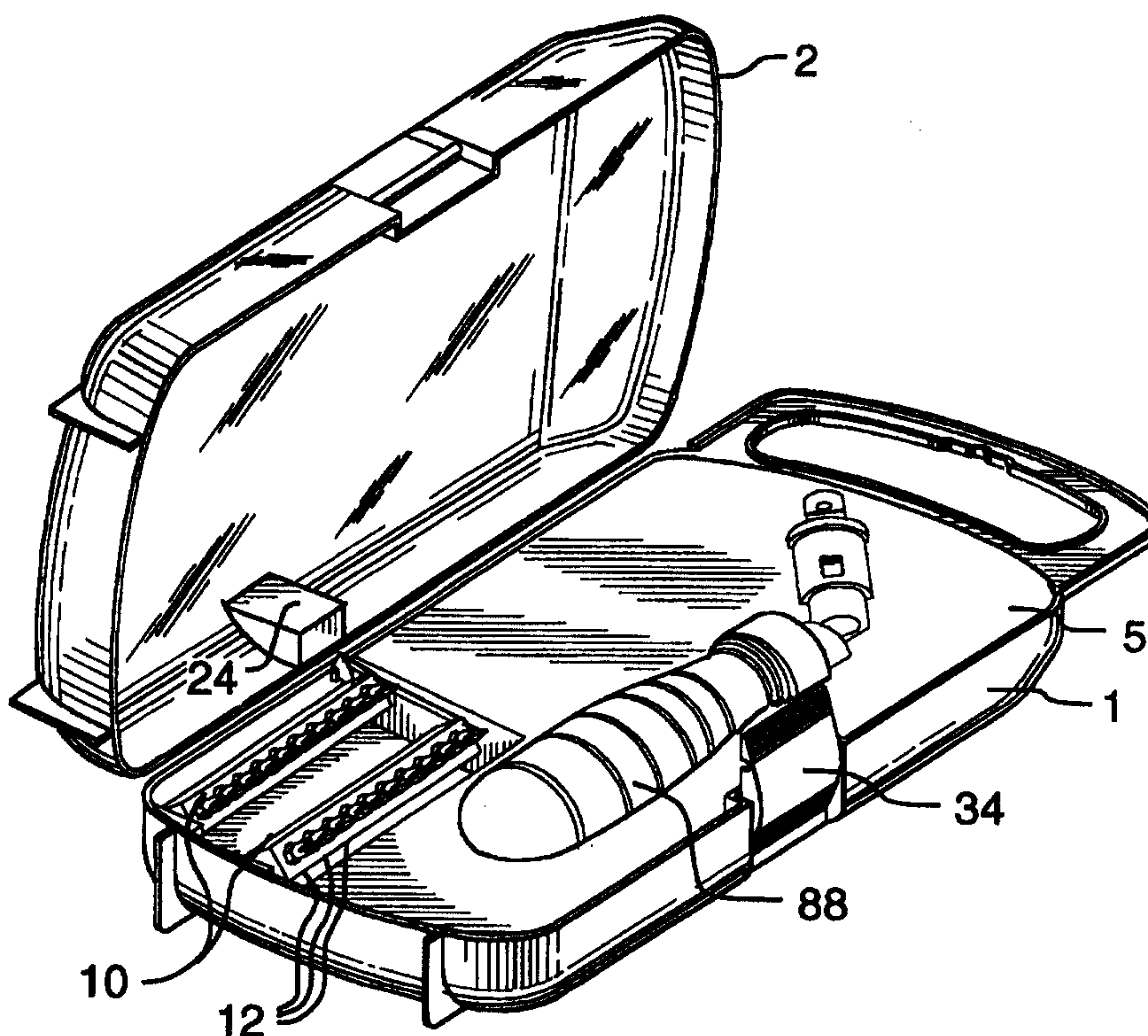
(57) L'invention porte sur une boîte contenant des outils telle qu'un coffret à outil comportant au moins un porte-éléments (10) monté pivotant à l'intérieur et pouvant pivoter entre une position de rangement et une position d'accès. Lesdits porte-éléments prennent la position d'accès lorsque le couvercle (2) est ouvert. Le coffret met directement ou indirectement un élément en contact (24) avec au moins l'un des porte-éléments pivotants pour le tourner dans la position de rangement quand le couvercle (2) se ferme sans qu'il y ait de connexion directe entre le couvercle les porte-éléments. Lorsqu'il y a plusieurs porte-éléments pivotants, ils peuvent être couplés par exemple par une barre (18) de liaison. Au lieu de pivoter lors de l'ouverture du couvercle, les porte-éléments peuvent le faire lorsqu'on sort ou range l'outil (88) auquel les éléments sont destinés. On peut manipuler à la main les éléments des porte-éléments pivotants entre la position de rangement et celle d'accès lorsque le couvercle est ouvert, indépendamment de la position du couvercle.

(57) A tool container, such as a toolbox or gift case, has at least one pivotable component holder (10) pivotally mounted therein for pivoting movement between a storage position and an access position. The pivotable component holders are biased towards the access position when the lid (2) is open. The tool container brings an element (24) directly or indirectly into contact with at least one of the pivotable component holders to rotate it to the storage position when the lid closes, with no direct connection between the lid and the pivotable component holders. Where there are multiple pivotable component holders, they may be ganged together, for example via a gang bar (18). Instead of rotation of the pivotable component holders being triggered by lid closure, such rotation could be triggered by removal or storage of the tool (88) for which the components are intended. Pivotable holder components may be manipulated manually between storage and access positions when the lid is open and movement may be independent of the lid position.

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(21) International Application Number: PCT/CA98/00747 (22) International Filing Date: 5 August 1998 (05.08.98) (30) Priority Data: 60/054,935 8 August 1997 (08.08.97) US 08/979,879 26 November 1997 (26.11.97) US 60/077,470 10 March 1998 (10.03.98) US (71) Applicant: MAXTECH MANUFACTURING INC. [CA/CA]; 620 McMurray Road, Waterloo, Ontario N2V 2E7 (CA). (72) Inventor: VASUDEVA, Kailash, C.; 10 Grand River Drive, Waterloo, Ontario N2J 4G8 (CA). (74) Agent: ARMSTRONG, R., Craig; Armstrong & Associates, 285 Fountain Street South, Cambridge, Ontario N3H 1J2 (CA).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: TOOLBOXES AND TOOL CASES WITH PIVOTABLE COMPONENT HOLDER (57) Abstract A tool container, such as a toolbox or gift case, has at least one pivotable component holder (10) pivotally mounted therein for pivoting movement between a storage position and an access position. The pivotable component holders are biased towards the access position when the lid (2) is open. The tool container brings an element (24) directly or indirectly into contact with at least one of the pivotable component holders to rotate it to the storage position when the lid closes, with no direct connection between the lid and the pivotable component holders. Where there are multiple pivotable component holders, they may be ganged together, for example via a gang bar (18). Instead of rotation of the pivotable component holders being triggered by lid closure, such rotation could be triggered by removal or storage of the tool (88) for which the components are intended. Pivotable holder components may be manipulated manually between storage and access positions when the lid is open and movement may be independent of the lid position.		



TOOLBOXES AND TOOL CASES WITH PIVOTABLE COMPONENT HOLDER**TECHNICAL FIELD**

This invention relates to toolboxes and tool cases, particularly ones in which sockets, bits and/or other such tool components are stored for use with corresponding tools such as socket wrenches, screwdrivers, drills, small power tools, etc., which may or may not be stored in the same toolbox or tool case. Such cases include but are not limited to those cases commonly referred to as "gift cases" or "socket cases", i.e. cases which act as point-of-purchase holders and which may also serve as permanent holders, and larger toolboxes which may have multiple drawers, for example.

BACKGROUND ART

Cases of these general types are well known. A gift case typically includes an open-topped box portion and a lid hinged to the box portion, with a clip, a clasp or the like to hold the lid shut. Various means are provided within such cases for holding tools and components, such as a socket wrenches/ratchets and sockets, or a screwdriver and various bits therefor, as two examples.

In the larger toolboxes, there may be a unit with multiple drawers, and commonly a storage area on top of the unit, with a hinged lid which can be raised to gain access.

In these toolboxes or tool cases, hereinafter simply referred to as tool containers, it is common to have multiple recesses for tool components, such as sockets. When such recesses are oriented parallel to the main plane of the container, it can be difficult to remove the sockets. When oriented at an angle to the main plane of the container, so as to be more accessible, a snug fit is normally employed to prevent the sockets from being dislodged when the tool container is carried around. In either case, this makes the sockets difficult to remove, especially with greasy or oily hands.

United States patent no. 5,533,625 (Mikkelsen) shows a container with a lift mechanism for rotating a holder, the holder being closed by rotation of the lid. United States patent nos. 3,074,539 (Rogovin), 3,353,657 (Young) and 4,006,821 (Sautter) are similar in that regard. Mikkelsen in essence discloses a tool container,

having a base and a lid connected thereto for movement between open and closed positions, the base having a pivotable component holder pivotally mounted therein for pivoting movement between a storage position and an access position, the pivotable component holder being biased towards the access position when the lid is open, the
5 tool container having actuation means responsive to closing of the lid, configured so as to contact the pivotable component holder as the lid closes so as to gradually rotate the
holder to its storage position.

For convenience, the word "sockets" will be used throughout this specification. However, it should be clearly understood that the invention is clearly
10 applicable to tool components other than sockets, and the use of the word "socket" is

not intended to exclude bits, wrenches, screwdrivers, power tools accessories or other such components.

In general, there remains a need for tool containers which provide secure storage for tool components when desired, and yet easy access to the components when required.

DISCLOSURE OF INVENTION

It is thus an object of the invention to provide a tool container which provides secure storage for tool components when desired, and yet easy access to the components when required.

In particular, it is an object of the invention to provide a tool container with tool component holders which are rotatable between a storage position and an access position where improved access to the components is provided. The component holders are configured to rotate upon opening the lid of the tool container, or in one embodiment by removing a tool, but are not directly linked to the lid, as explained in detail below. In all circumstances, in the case when jamming occurs the component holders may be manually rotated into the storage or access position.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in detail with reference to the accompanying drawings, in which:

- Fig. 1 is a perspective view of a preferred embodiment of a tool case;
Fig. 2 is an exploded perspective of the Fig. 1 tool case, showing the various components of the mechanism of the pivotable component holders;
Fig. 3 is a side cross-section of the Fig. 1 tool case in the closed position;
Fig. 4 is a front cross-section in the area of the side of one of the pivotable component holders;
Fig. 5 is a side cross-section of the Fig. 1 embodiment, showing the tool case in the partially-open position;
Fig. 6 is a plan view showing a tool case embodiment with rotating component holders at different locations within the tool container;

Fig. 6A is a plan view showing a second tool case embodiment with rotating component holders at different locations within the tool container;

Fig. 7 is a perspective view showing a first embodiment of a toolbox lid, which uses a cam to actuate the rotation of the component holders;

5 Fig. 8 is a cross-section showing a torsion spring at the side of a component holder;

Figs. 9 and 10 are side views showing the rotation of the component holders as the lid is closed;

10 Fig. 11 is a perspective view of a second embodiment of a toolbox, which uses a clip on a linkage arm between the toolbox and its lid;

Fig. 12 is a perspective view showing the clip on the linkage arm between the toolbox and its lid;

Figs. 13-15 are side views showing the movement of the linkage arm and clip as the toolbox lid is closed;

15 Figs. 16A - 16D are side cross-sections of a wall-mountable or bench-top container illustrating component holders with rotate open via gravity, and which are closed by closing the lid;

Figs. 17A and 17B show an optional manual lock in the container of Figs. 16A-16D;

20 Fig. 18 is a plan view showing a tool case where the mechanism is actuated not by lifting the lid, but by removing a tool;

Fig. 19 is a side cross-section of the Fig. 18 tool case, showing the weight of the tool holding the cam down and hence holding the component holders in the storage position;

25 Fig. 20 is a side cross-section of the Fig. 18 tool case, showing the tool lifted, such that the component holders are free to rotate from the storage position;

Figs. 21 and 22 are side views showing an alternative means of ganging the component holders together;

30 Fig. 23 is a perspective view of a third embodiment of a toolbox, wherein a component holder tray is detachable from a main tray positioned within the toolbox;

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Fig. 24 is a perspective view of the removable tool component tray and the main tray;

Fig. 24A is a rear perspective view of the removable tool component tray;

Fig. 25 is a front perspective view of the removable tool component tray with the locking knob in an open position and the component holders rotated upwards;

Fig. 26 is a plan view of the removable tool component tray;

Fig. 27 is a close-up plan view of the locking knob mechanism; and,

Figs. 28A - 28B are perspective views of alternative embodiments of the removable tool component tray.

BEST MODES FOR CARRYING OUT THE INVENTION

The tool case of the invention, shown in Figs. 1-6, includes a main box portion 1 and a lid 2 hinged to the box portion, for example by two hinges 3. Alternatively, the lid may be latched, rather than being hinged, onto the box portion. A clip 34 or other suitable securing means holds the lid shut in conventional fashion. The main box portion typically is blow molded or injection molded. A panel 5 positioned in the box portion has various recesses defined therein to accommodate tools, such as a ratchet or other large tool 88. Various sockets or other components 12 may be stored in such recesses as well, or as in the invention, may be stored in pivotable holders 10. Each pivotable holder has a number of component-holding clips, posts, recesses 11 or other suitable means, or may simply be a small bin or number of bins.

In toolboxes such as those shown in Figs. 7-15, trays 8 positioned in the storage areas (i.e. whether the upper storage area or the drawers) have similar pivotable holders 10. Each pivotable holder has a number of component-holding recesses 11, to hold components 12 such as sockets, for example. The trays may be fixed in place, or may be removable. If removable, the trays preferably should be provided with a manual locking means, as in or similar to the Figs. 17A-17B means described below, so that the component holders can be locked in their storage position notwithstanding the fact that the lid has been raised.

As with the tool cases, the toolbox 1 has a lid 2 hinged thereto. The lid is typically but not necessarily constrained by linkage arms 3 which pivot at elbow joints

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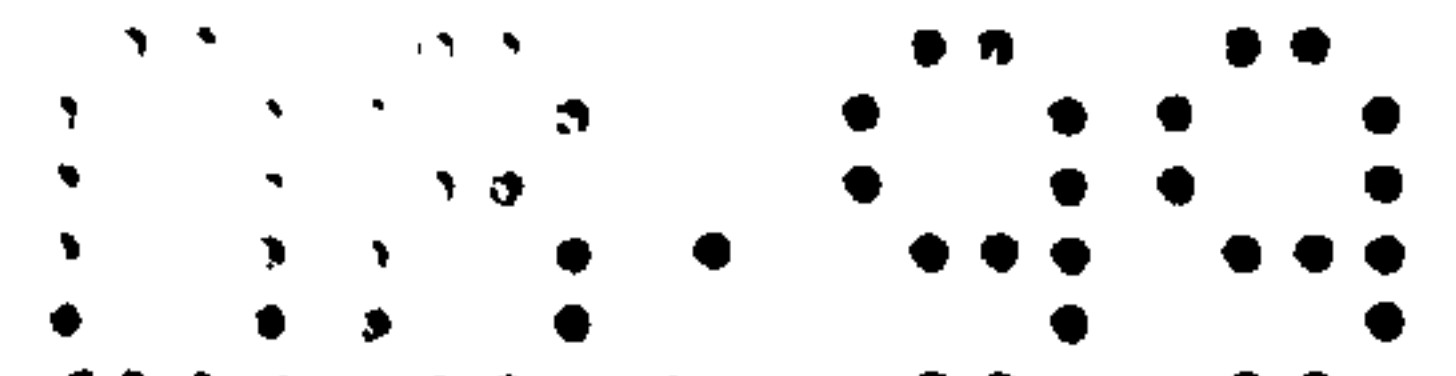
4, as in the embodiment of Figs. 11-15. Opening the lid reveals an upper storage area 5. Multiple drawers 6 are aligned beneath the upper storage area, and constitute additional storage areas which may or may not contain additional trays.

Each pivotable holder is pivotally mounted in side walls 14 of either a large recess (in the case of a tool case) or a tray 8 (in the case of a toolbox), via pivot pins 16. Various means may be employed to move the pivotable holders between a storage position when the storage area is closed, and an access position where the sockets or other components are more easily accessible. In the storage position, the sockets will normally but not necessarily be generally parallel to the main plane of the storage area, which in most cases is a horizontal plane (but see the embodiment of Figs. 16A-16D and 17A-17B, which is also within the scope of the invention). In the access position, the sockets will be angled outwardly from that plane, for easier access.

If there are several pivotable holders, as in the preferred embodiments, then ganging means such as a gang bar 18, or two gang bars 18 (one on each side) may be used to connect the pivotable holders, via gang pins 20 which fit into holes 22 in the gang bar or bars. Figs. 21 and 22, described in greater detail below, show one of many possible alternative ganging means.

In the preferred embodiment of the tool case, shown in Figs. 1-6, when the tool container is closed, a block 24 on the lid contacts a cam 26 which is rotated downwardly to push an actuation bar 17 into a position in which the first holder is rotated into a horizontal storage position, as seen in Fig. 3. By virtue of the gang bar(s) 18, this results in any additional holders also being rotated to the storage position. As seen in Fig. 4, a spring 28 may be mounted on at least one of the pivot pins 16, to bias the holders to an upwardly rotated position. Thus when the tool container is opened, such that the block no longer bears against the cam, the holders swing upwardly under the influence of the spring or springs. Alternatively, by suitable selection of the location of the pivot pins 16, the design may be such that gravity rotates the holders into their access position, so that no spring is required. Closing the lid then forces the holders into their storage position against the force of gravity instead of against the spring force.

In the preferred embodiment of the toolbox, shown in Figs. 7-10, the principle is very similar. A cam 29 mounted on the lid is used as the means for



contacting the pin 25, in this case the pin of the rearmost row of holders. This could be viewed as equivalent to the block 24, but shaped so as to avoid the need for a cam 26. The lid thus acts directly against the first holder (but with no direct connection thereto), with the remaining holders being ganged to the first holder.

5 In an alternative embodiment of the toolbox, shown in Figs. 11-15, when the lid 2 is opened to expose the upper storage area 5, a clip 24' on the lower one of the linkage arms 3 releases a pin 25 on one of the pivotable holders 10. A torsion spring 28 or gravity then causes the holders to rotate upwardly. The holders are ganged together as mentioned above.

10 When the lid is moved towards the closed position, the angled surface 27 of the clip comes into contact with the pin 25, acting to gradually rotate the holder into its storage position. This sequence can be seen in Figs. 13-15.

Figs. 16A-16D and 17A-17B are side cross-sections showing a wall-mountable or bench-top container. Figs. 16A-16D show the container oriented vertically, as it would be if mounted on a wall. Figs. 17A and 17B show the container oriented at a slight angle from the vertical, as if positioned on a workbench with the cover 2 rotated past 270 degrees from its closed position so as to act as a support stand for the case. In this embodiment, the component holders are biased towards the access position when the lid is open. This biasing is preferably by virtue of gravity, but

20 a spring could be used if desired. As well, component holders may be manually rotated, if desired. The component holders include a bottom bin 10'. When the cover is moved towards the closed position, the bottom edge of the cover comes into contact with a tab 40 which extends upwardly from the outer edge of the bottom bin. As the cover is closed, in the sequence shown in Figs. 16A-16D, the contact between the cover and the tab gradually moves the bottom bin to its storage position. The surface of the cover 2 aligns with the outer surface of the bottom bin, such that visually the outer surface of the bottom bin becomes part of the cover.

25 In the same manner as in the other embodiments, the component holders 10 and the bottom bin 10' are ganged together, so that closing the cover also rotates these holders 10 into their storage position.

30

Figs. 17A and 17B show an optional manual lock, in the form of a locking tab 45 projecting upwardly from the upper component holder, to be engaged by a manually-actuated catch 46. Releasing the catch 46 allows the component holders to rotate to their access positions. This feature gives the owner the option of removing the cover 2 entirely, and carrying the case from place to place with the component holders nevertheless still in their storage positions. On arriving at the work location, the owner simply release the catch 46 to gain access to the tool components.

Obviously, the tool container could have the actuation mechanism at one location, with one component holder, or there could be several ganged holders as in the preferred embodiment, or there could be several holders at different locations within the tool container, actuated by separate mechanisms (as in Figs. 6 and 18), or by the same mechanism centrally located between the holders.

Yet another alternative would be as shown in Figs. 18-20. In this embodiment, the weight of the tool 88 holds down the cam 26. By virtue of the actuation bar 17 and gang bar 18, this results in the holders being held in their storage positions. When the tool is removed, springs or gravity produce rotation of the component holders.

Figs. 21-22 show an alternative ganging means to the use of a gang bar. In Figs. 21-22, ganged motion is brought about by pins 85 riding in appropriately-shaped slots 84 of adjacent holders 10. Rotation of one of the holders causes movement of its pin 85 which causes corresponding rotation of the adjacent holder by virtue of the position of the pin of the first holder in the slot 84 of the adjacent holder.

Figs. 23-27 show a third embodiment of a toolbox, wherein a component holder tray 9 is detachable from a main tray 8 positioned within the toolbox. In the same manner as in the other embodiments, the tool component holders are ganged together, so that closing the cover also rotates these holders, on the upper most tray, into their storage position. However, in this embodiment of the invention, the user may advantageously detach the removable tool component tray 9 from the rest of the toolbox and use it, for example, alongside the user under a car. Figs. 24 and 24A illustrates how the removable tool component tray 9 is slidably mounted within the main tray 8 via tabs 6' that register with corresponding receiving apertures in the rear of the

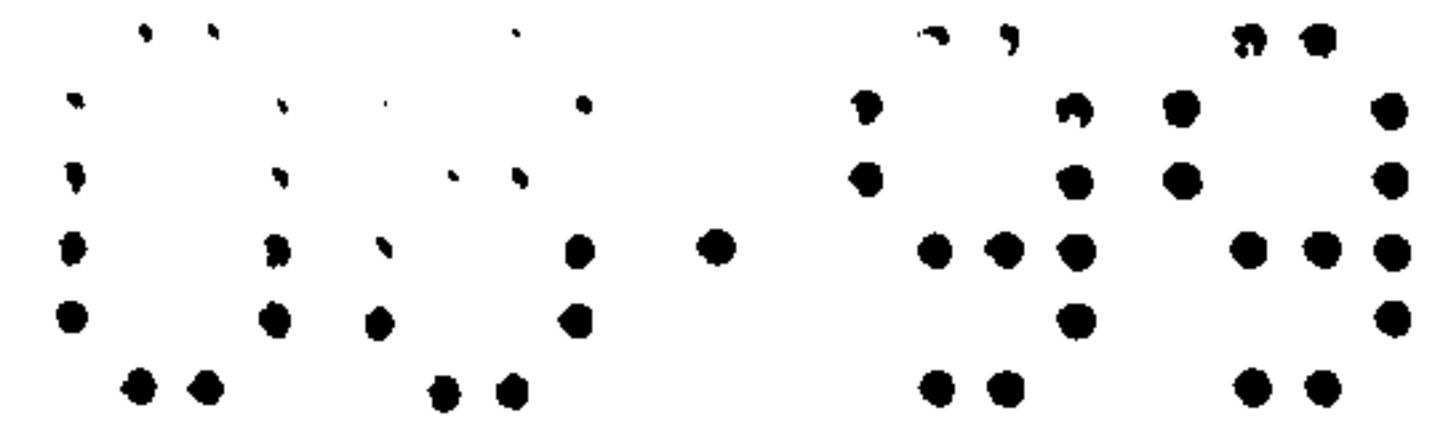
main tray 8. Alternatively, the main tray may not be necessary. Instead, the removable tray can be slidably mounted into corresponding receiving apertures adapted to the toolbox.

Fig. 25 shows the removable tool component tray with the locking knob in an open position and the component holders rotated upwards and readily accessible to the user. In the case where the removable trays are used in conjunction with the drawers of the toolbox, for short components, the component holders are normally angularly displaced, whereas, for long components, it is necessary to store them horizontally and rotate the same when desired. In the case when the removable tool component tray is detached from the toolbox, and when the tool components are desired to be in their stored position, they are manually reset into their storage position and locked in that position by setting the locking knob 7' to a close position as shown in Figs. 26-27. The locking means 5' includes a stop that resists any movement of the tool component holders upwards. As shown in Figs. 28A - 28B are alternative embodiments of the removable tool component tray wherein large tools may be adapted onto the removable tool component tray.

It should be clearly understood that it is not presently intended that the invention be limited to specific means of achieving the rotation. In addition to the specific means described above and illustrated in the drawings, obviously there are many other similar mechanisms which could be employed which would be equally effective. The essence is pivoting of the component holders actuated by opening a lid or cover or by removing a tool, with no direct linkage between the lid or cover or tool and the component holders themselves.

INDUSTRIAL APPLICABILITY

The invention provides an improved tool container with pivotable tool component holders.

**CLAIMS:**

1. A tool container, having a base (1) and a lid (2) connected thereto for movement between open and closed positions, said base having at least one pivotable component holder (10) pivotally mounted therein for pivoting movement between a storage position and an access position, each said pivotable component holder being biased towards said access position when said lid is open, said tool container having actuation means (24, 24', 29, or 10') responsive to closing of said lid, said actuation means not directly connected to any said pivotable component holder and not serving to bias any said pivotable component holder towards its access position, said actuation means being configured so as to contact a first said pivotable component holder as said lid closes so as to gradually rotate said first pivotable component holder to its storage position, characterized by said actuation means comprising an element (24) extending from said lid so as to contact a cam (26) to rotate said cam, said cam being connected to a first pivotable component holder (10) via an actuation bar (17).
2. A tool container as recited in claim 1, comprising at least two pivotable component holders (10), ganged with said first pivotable component holder by ganging means (18).
3. A tool container as recited in claim 2, where said ganging means is a gang bar (18) connecting said pivotable component holders.
4. A tool container, having a base (1) and a lid (2) connected thereto for movement between open and closed positions, said base having at least one pivotable component holder (10) pivotally mounted therein for pivoting movement between a storage position and an access position, each said pivotable component holder being biased towards said access position when said lid is open, said tool container having actuation means (24, 24', 29, or 10') responsive to closing of said lid, said actuation means not directly connected to any said pivotable component holder and not serving to bias any said pivotable component holder towards its access position, said actuation means being configured so as to contact a first said pivotable component holder as said



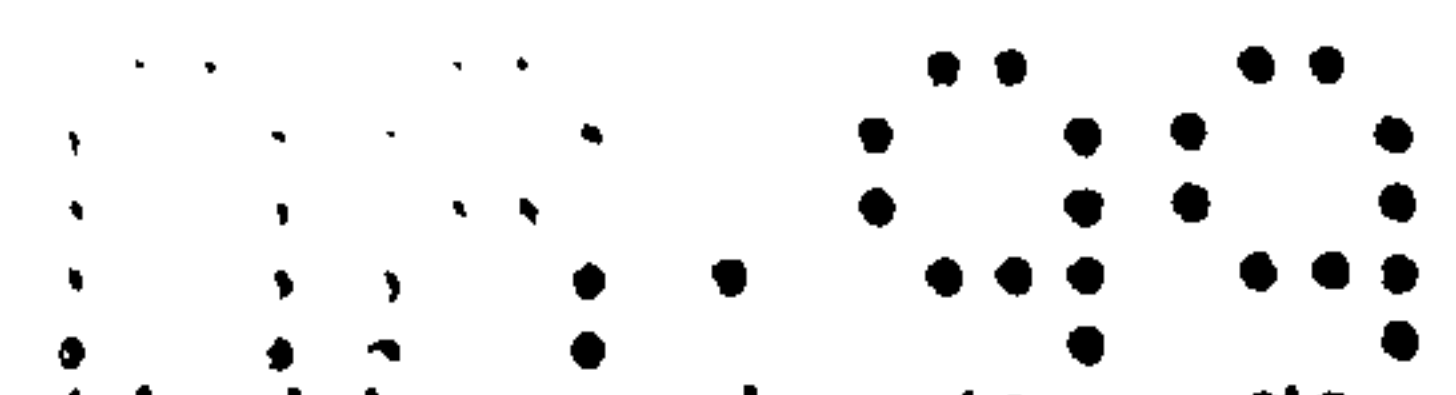
lid closes so as to gradually rotate said first pivotable component holder to its storage position, characterized by said actuation means comprising an element (29) extending from said lid so as to contact a first one of at least two pivotable component holders (10), said element being shaped so as to gradually rotate said first pivotable component holder (10) to its storage position as said lid (2) closes, said pivotable component holders being ganged with said first pivotable component holder by ganging means.

5. A tool container as recited in claim 4, where said ganging means is a gang bar (18) connecting said pivotable component holders.

6. A tool container, having a base (1) and a lid (2) connected thereto for movement between open and closed positions, said base having at least one pivotable component holder (10) pivotally mounted therein for pivoting movement between a storage position and an access position, each said pivotable component holder being biased towards said access position when said lid is open, said tool container having actuation means (24, 24', 29, or 10') responsive to closing of said lid, said actuation means not directly connected to any said pivotable component holder and not serving to bias any said pivotable component holder towards its access position, said actuation means being configured so as to contact a first said pivotable component holder as said

lid closes so as to gradually rotate said first pivotable component holder to its storage position, characterized by said actuation means comprising a clip (24') removably mounted onto on a linkage arm (3, 4) between said lid (2) and a body of said container, said clip having an angled surface (27) positioned to contact a first pivotable component holder (10) and shaped so as to gradually rotate said first pivotable component holder to its storage position as said lid closes.

7. A tool container, having a base (1) and a lid (2) connected thereto for movement between open and closed positions, said base having at least one pivotable component holder (10) pivotally mounted therein for pivoting movement between a storage position and an access position, each said pivotable component holder being biased towards said access position when said lid is open, said tool container having actuation means (24, 24', 29, or 10') responsive to closing of said lid, said actuation



means not directly connected to any said pivotable component holder and not serving to bias any said pivotable component holder towards its access position, said actuation means being configured so as to contact a first said pivotable component holder as said lid closes so as to gradually rotate said first pivotable component holder to its storage position, characterized by said actuation means comprising a tab (40) extending from a first pivotable component holder so as to be contacted by a portion of said lid when said lid closes, said contact rotating said first pivotable component holder to its storage position.

8. A tool container as recited in claim 1, further characterized by manual locking means (7', 45, 46) for locking each said pivotable component holder in said storage position notwithstanding said lid not being closed.

9. A tool container, having a base (1) and a lid (2) connected thereto for movement between open and closed positions, said base having at least one pivotable component holder (10) pivotally mounted therein for pivoting movement between a storage position and an access position, each said pivotable component holder being biased towards said access position when said lid is open, said tool container having actuation means (24, 24', 29, or 10') responsive to closing of said lid, said actuation

means not directly connected to any said pivotable component holder and not serving to bias any said pivotable component holder towards its access position, said actuation means being configured so as to contact a first said pivotable component holder as said lid closes so as to gradually rotate said first pivotable component holder to its storage position, characterized by multiple pivotable component holders (10) mounted in at least one removable tray (9).

10. A tool container as recited in claim 9, further comprising manual locking means (5', 7') for locking said pivotable component holders in said storage position within each said removable trays.

11. A tool container having at least one tool holding position therein and at least one pivotable component holder (10) pivotally mounted therein for pivoting

movement between a storage position and an access position; each said pivotable component holder being biased towards said access position, said tool container having actuation means responsive to placement of a tool in said tool holding position, said actuation means urging each said pivotable component holder to said storage position as said tool is placed in said tool holding position.

12. A tool container as recited in claim 11, where said actuation means comprises a cam (26) positioned in said tool holding position so as to be rotated by said tool when said tool is placed in said tool holding position, said cam being connected to a first pivotable component holder (10) via an actuation bar (17, 18), rotation of said cam producing rotation of said first pivotable component holder.

13. A tool container as recited in claim 12, comprising at least two pivotable component holders (10), ganged with said first pivotable component holder by ganging means.

14. A tool container as recited in claim 13, where said ganging means is a gang bar (18) connecting said pivotable component holders.

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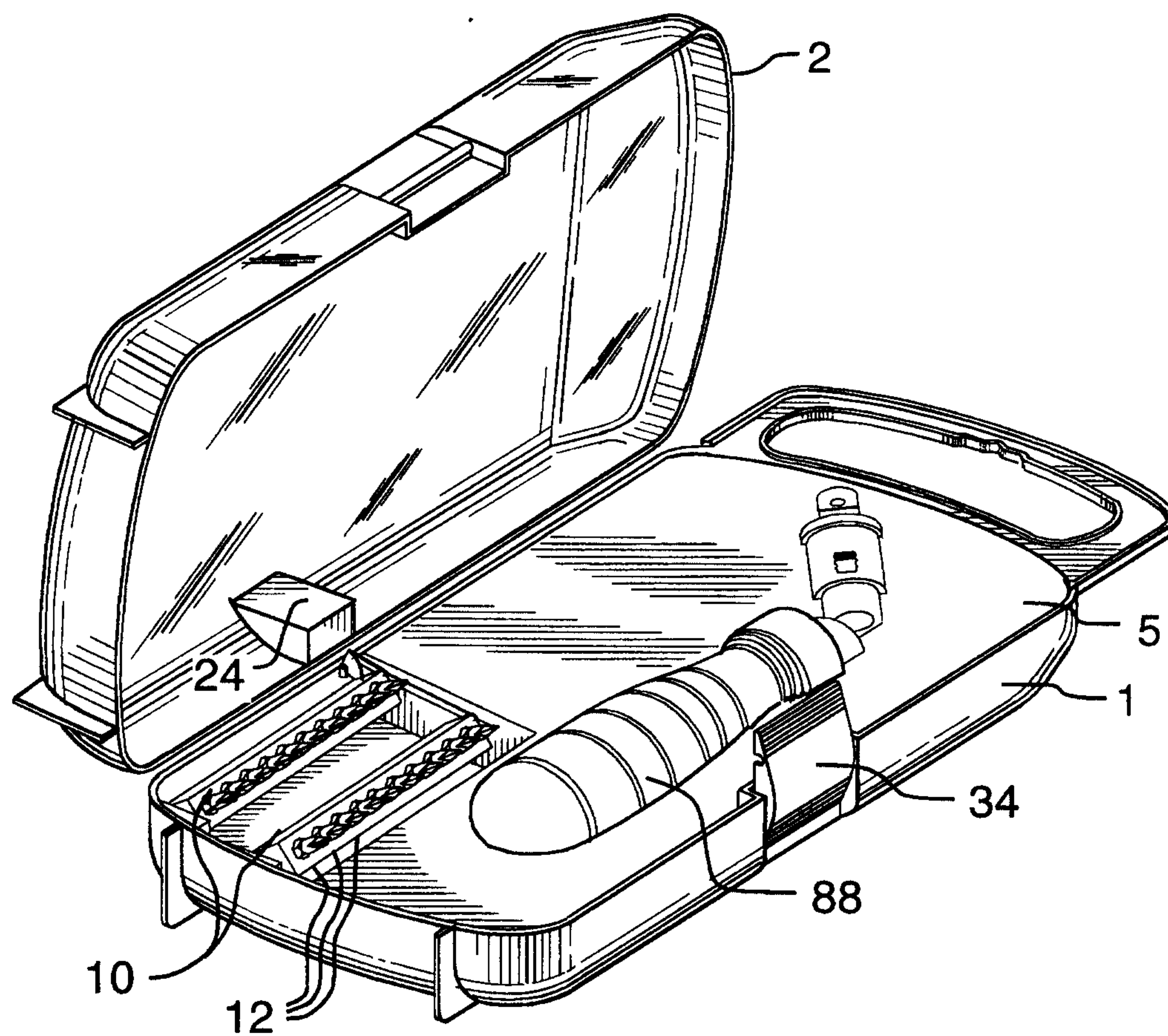


FIG.1

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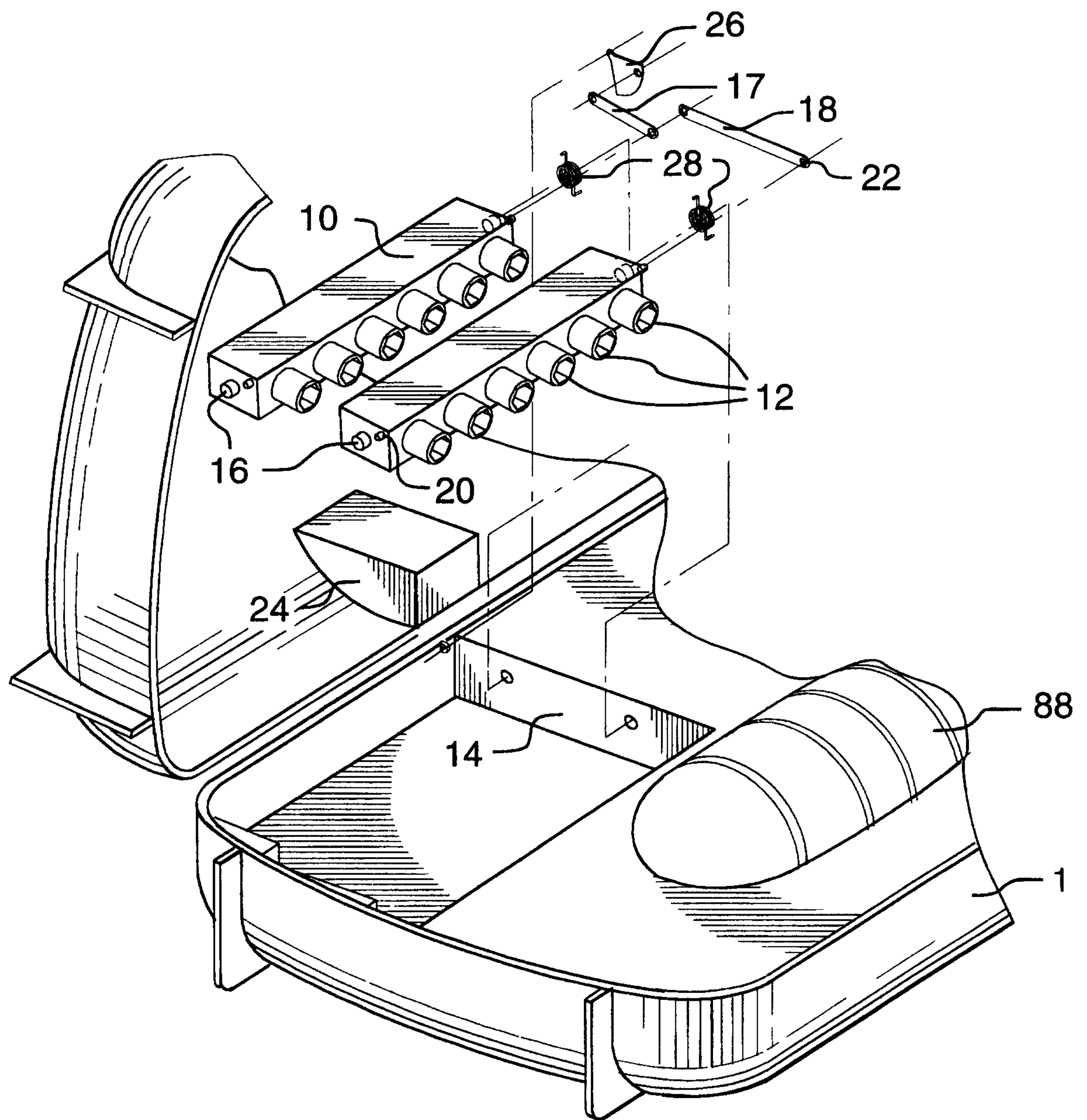


FIG.2

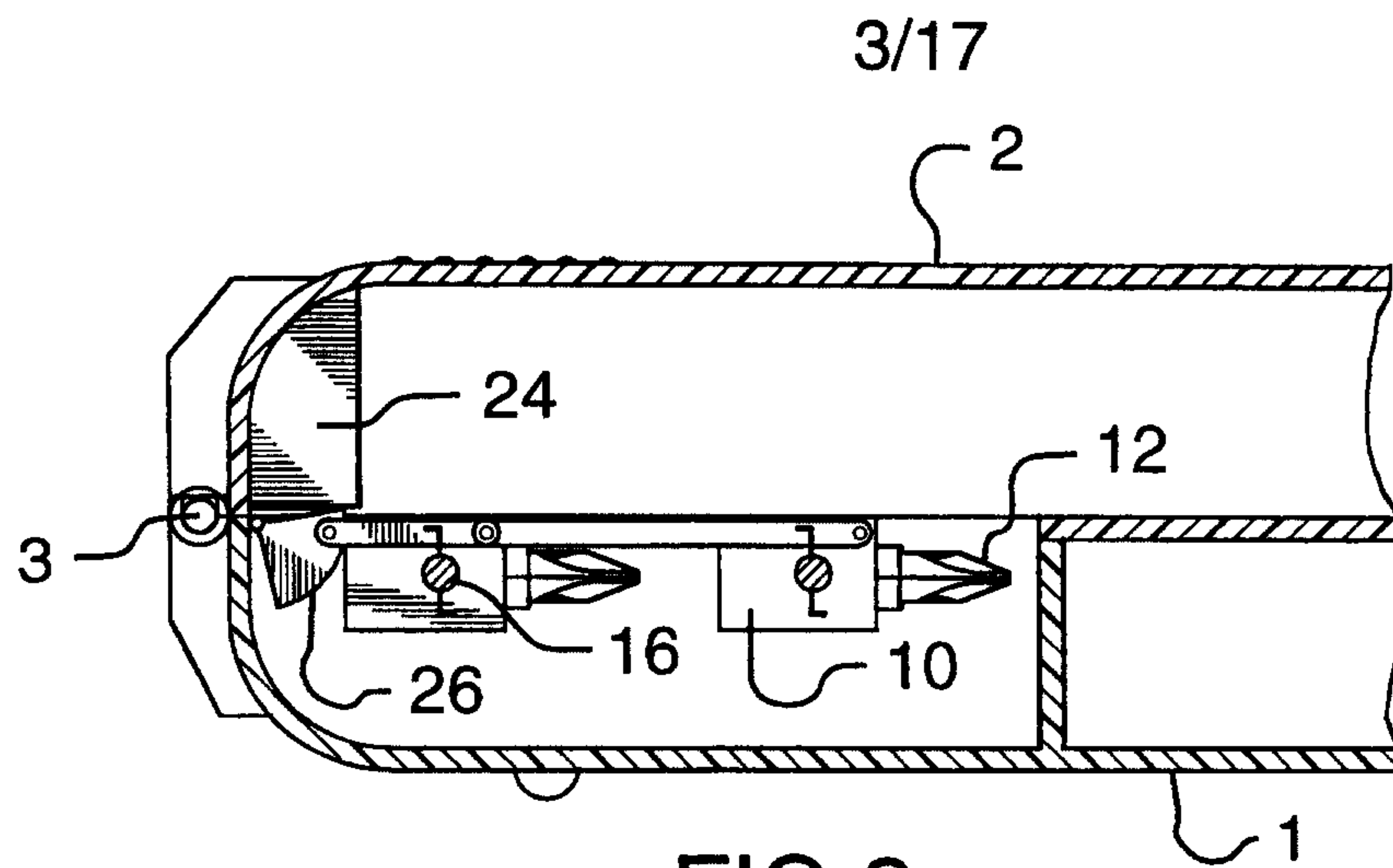


FIG. 3

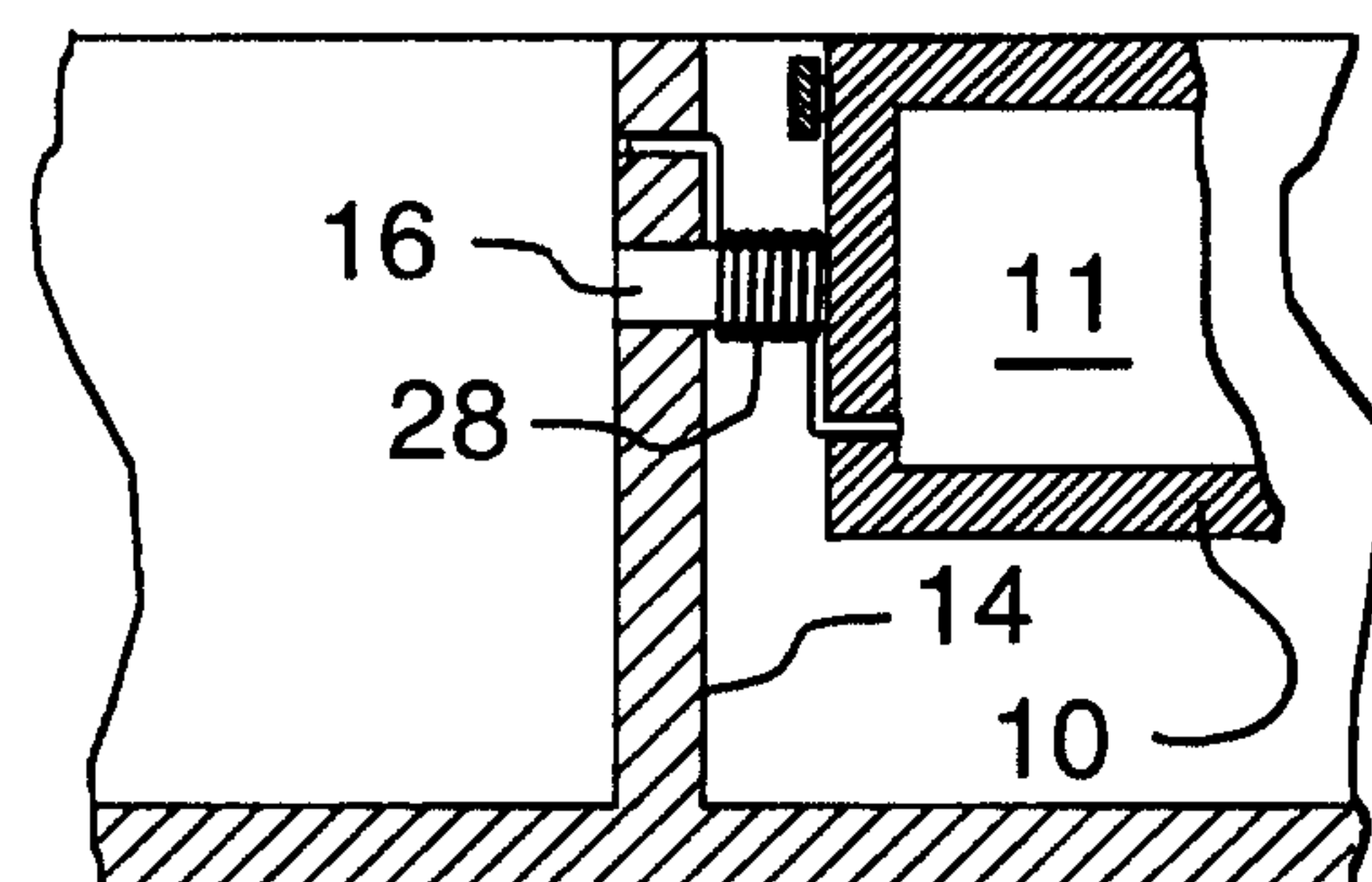


FIG. 4

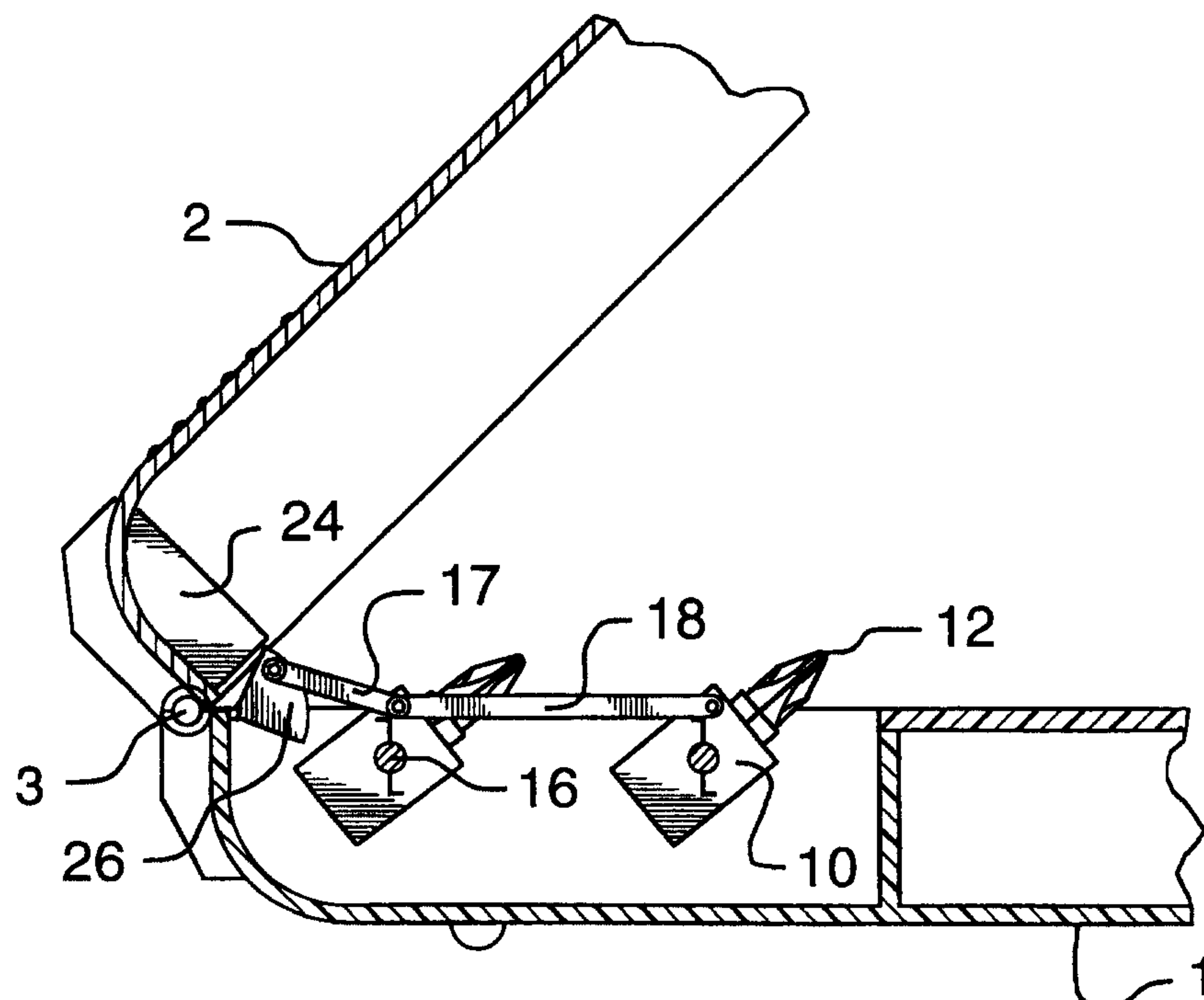


FIG. 5

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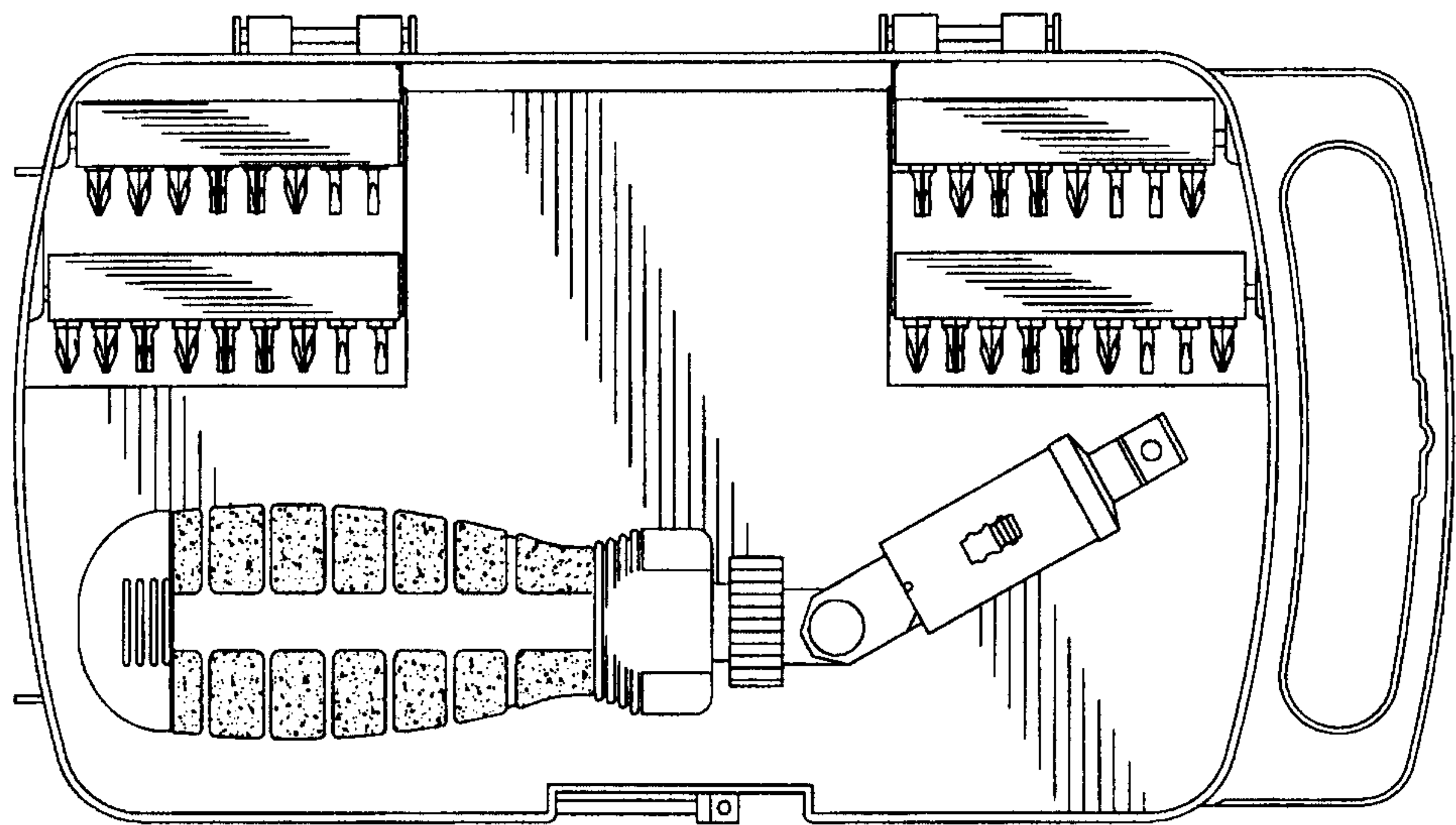


FIG.6

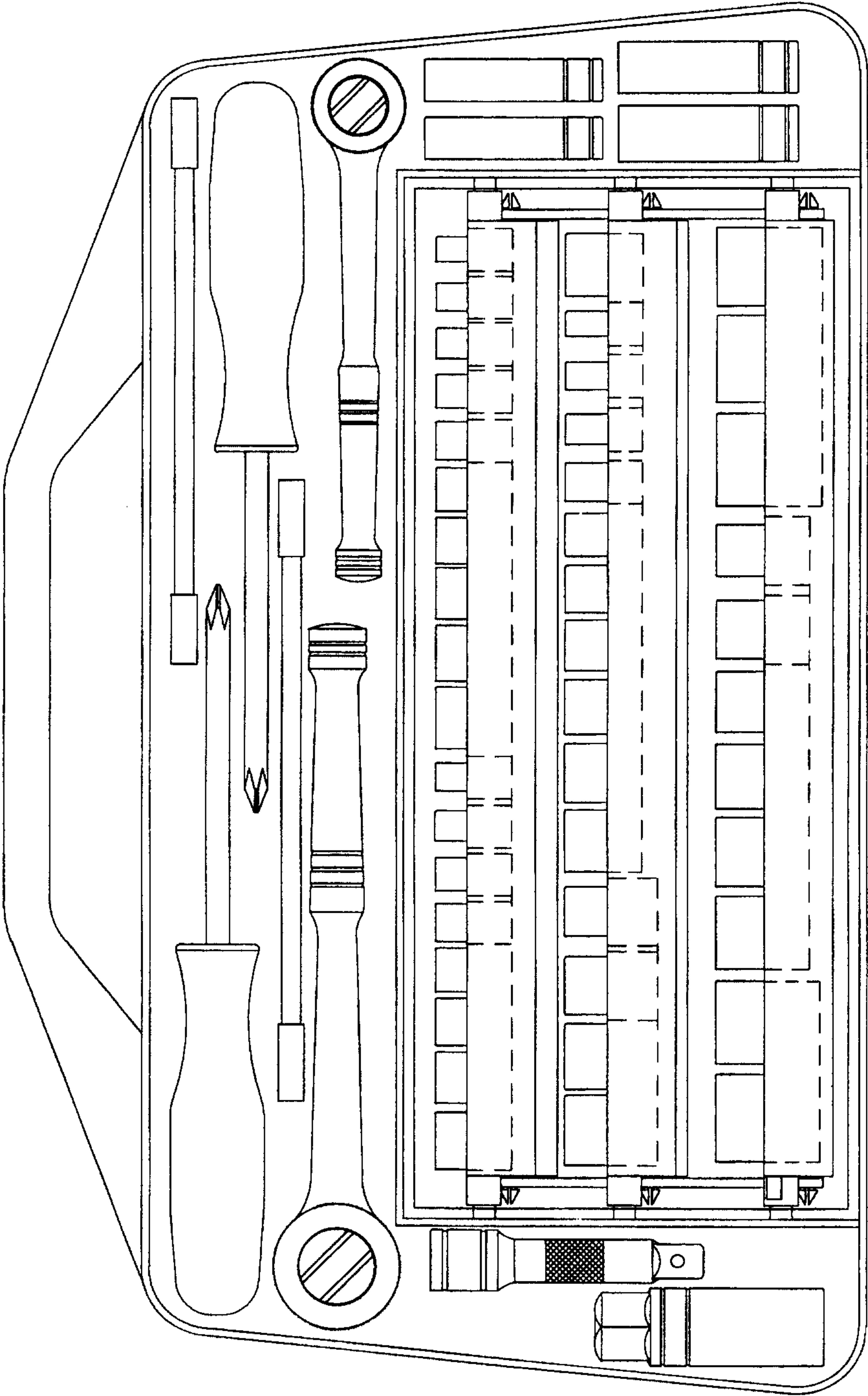


FIG.6A

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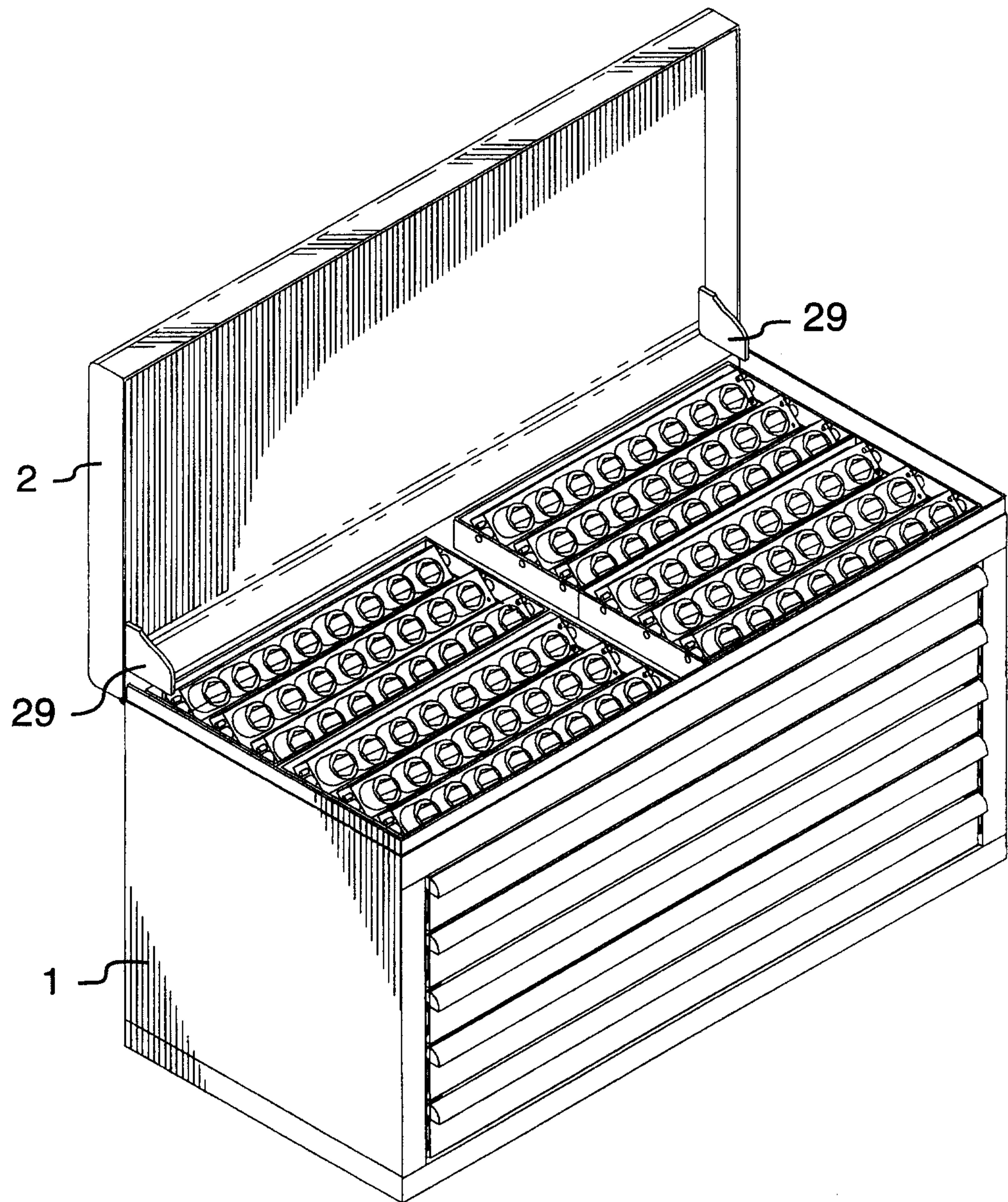


FIG. 7

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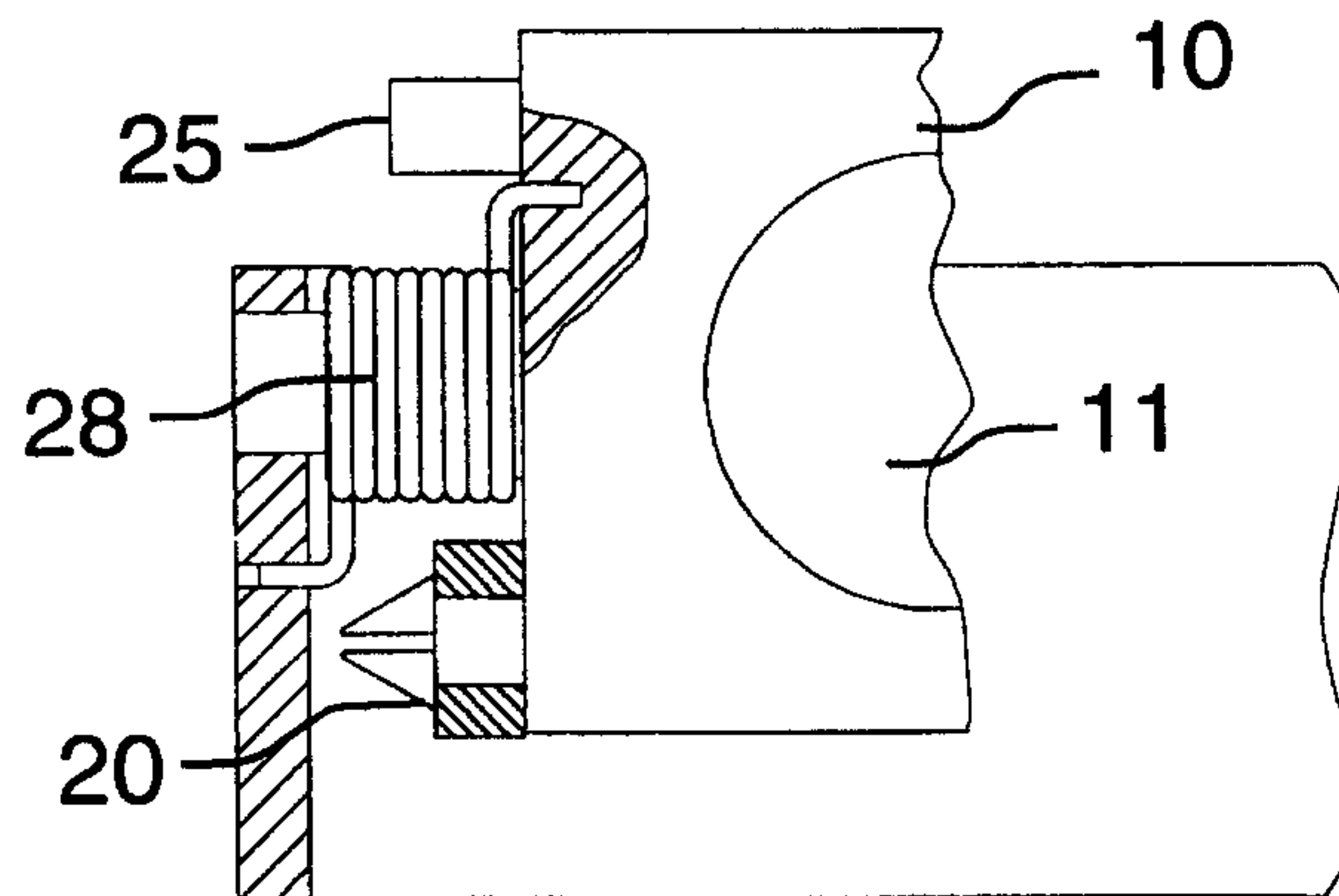


FIG. 8

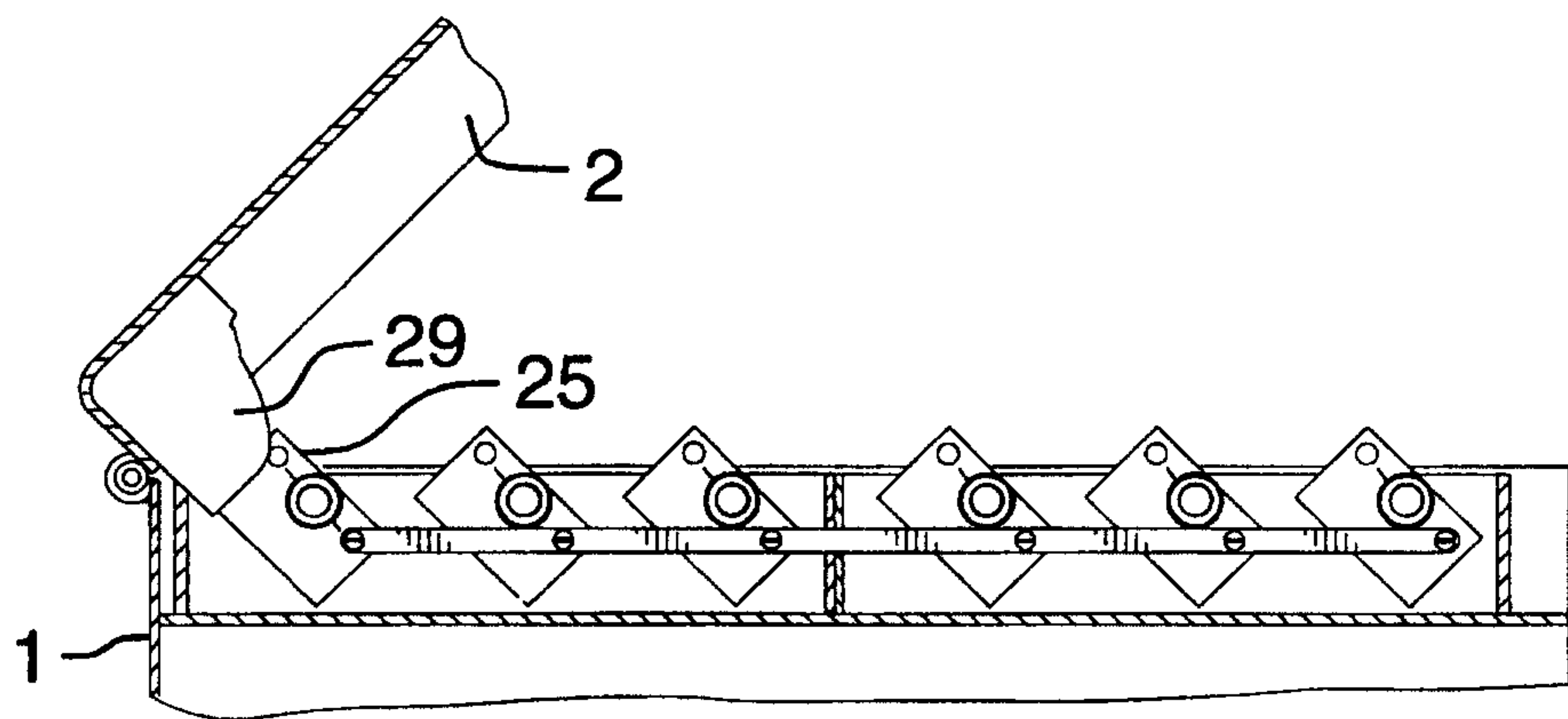


FIG. 9

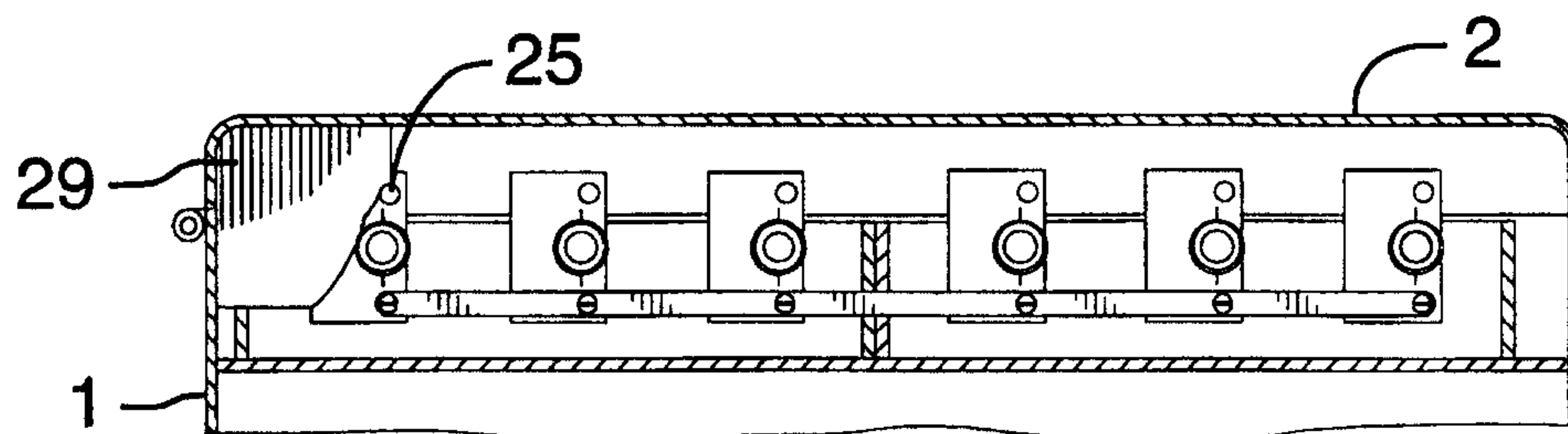


FIG. 10

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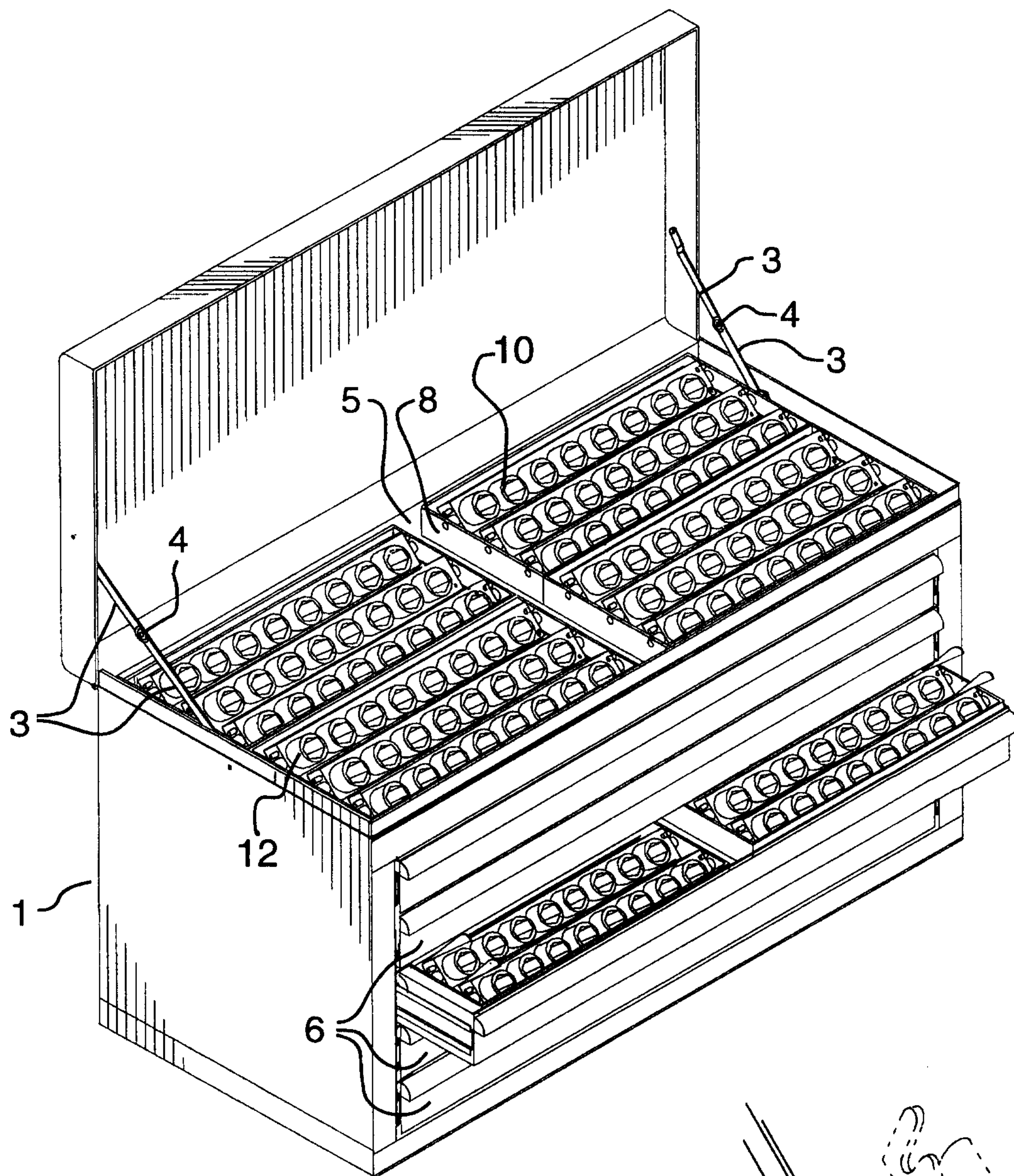


FIG. 11

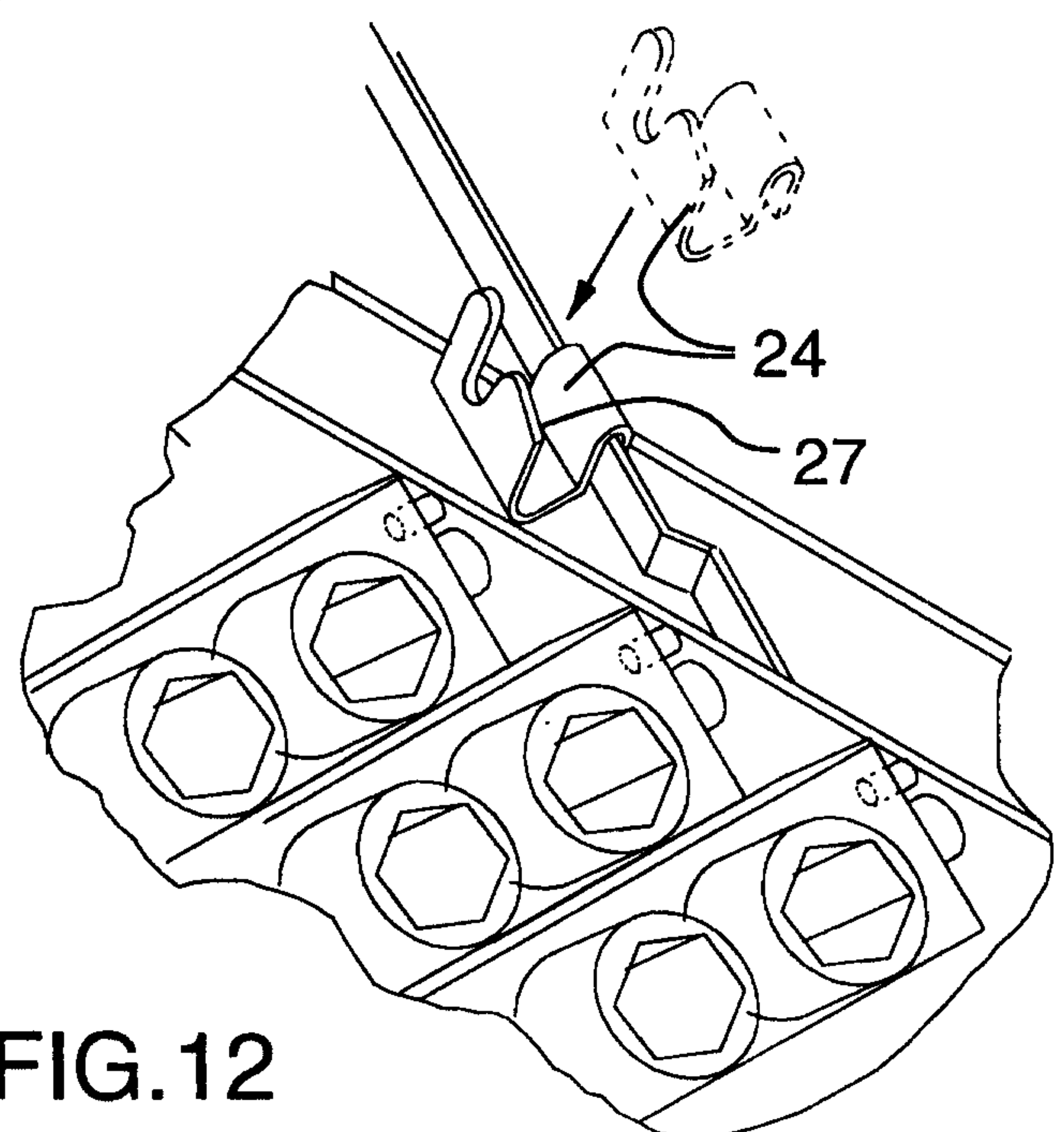


FIG. 12

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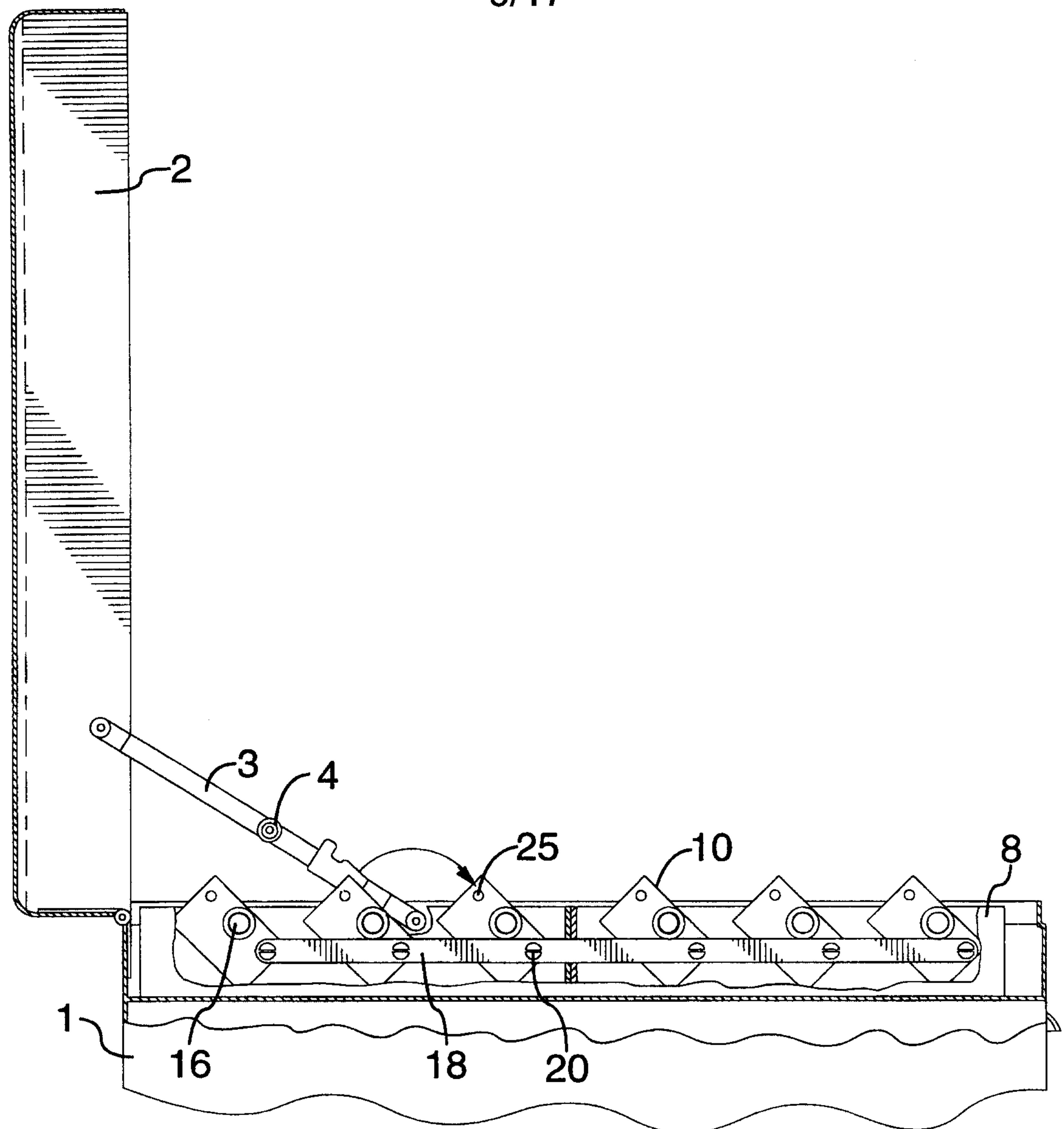


FIG. 13

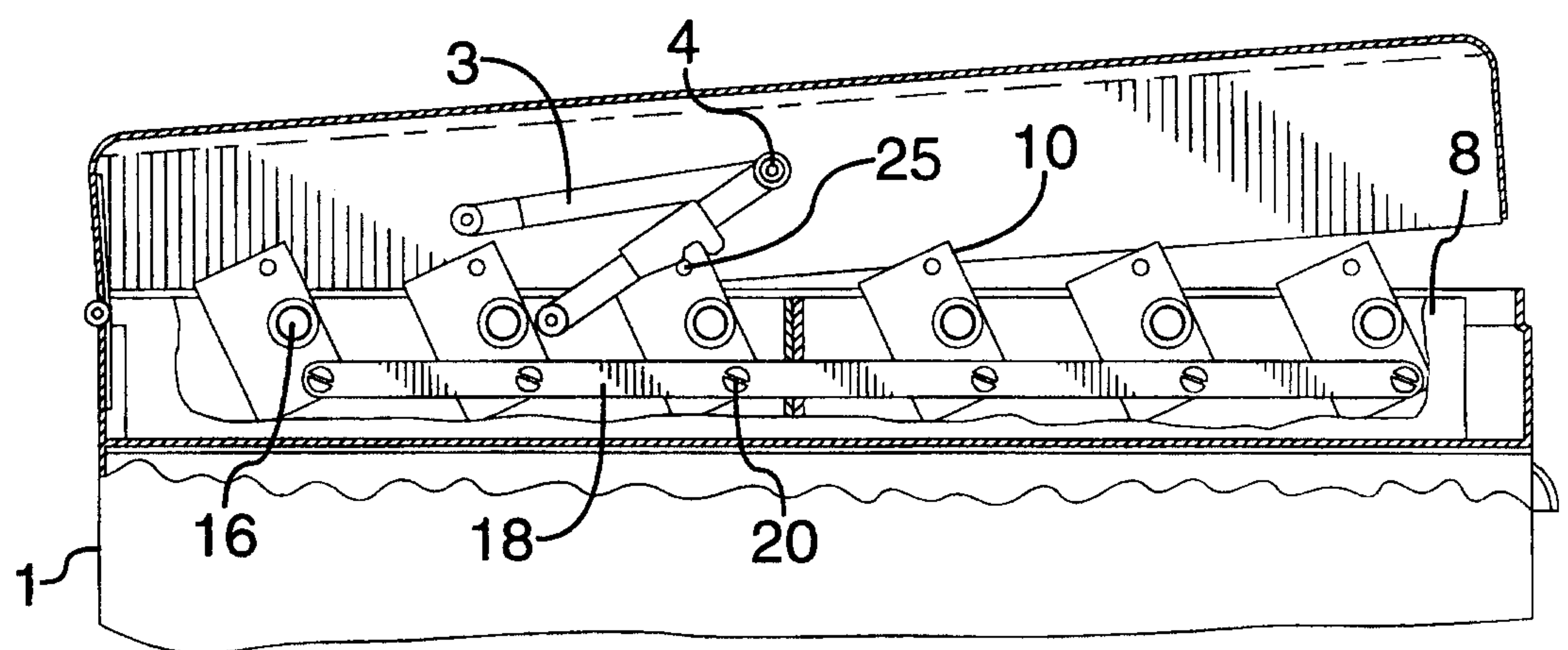


FIG. 14

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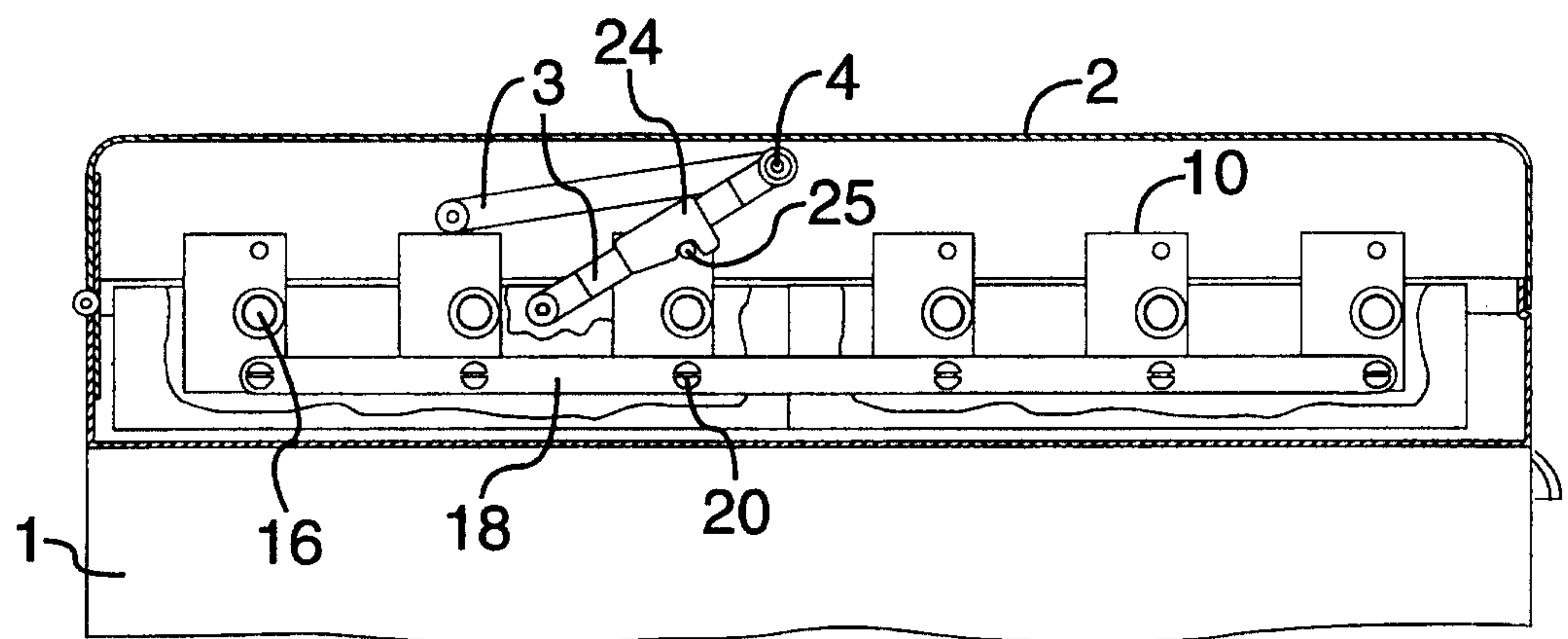


FIG.15

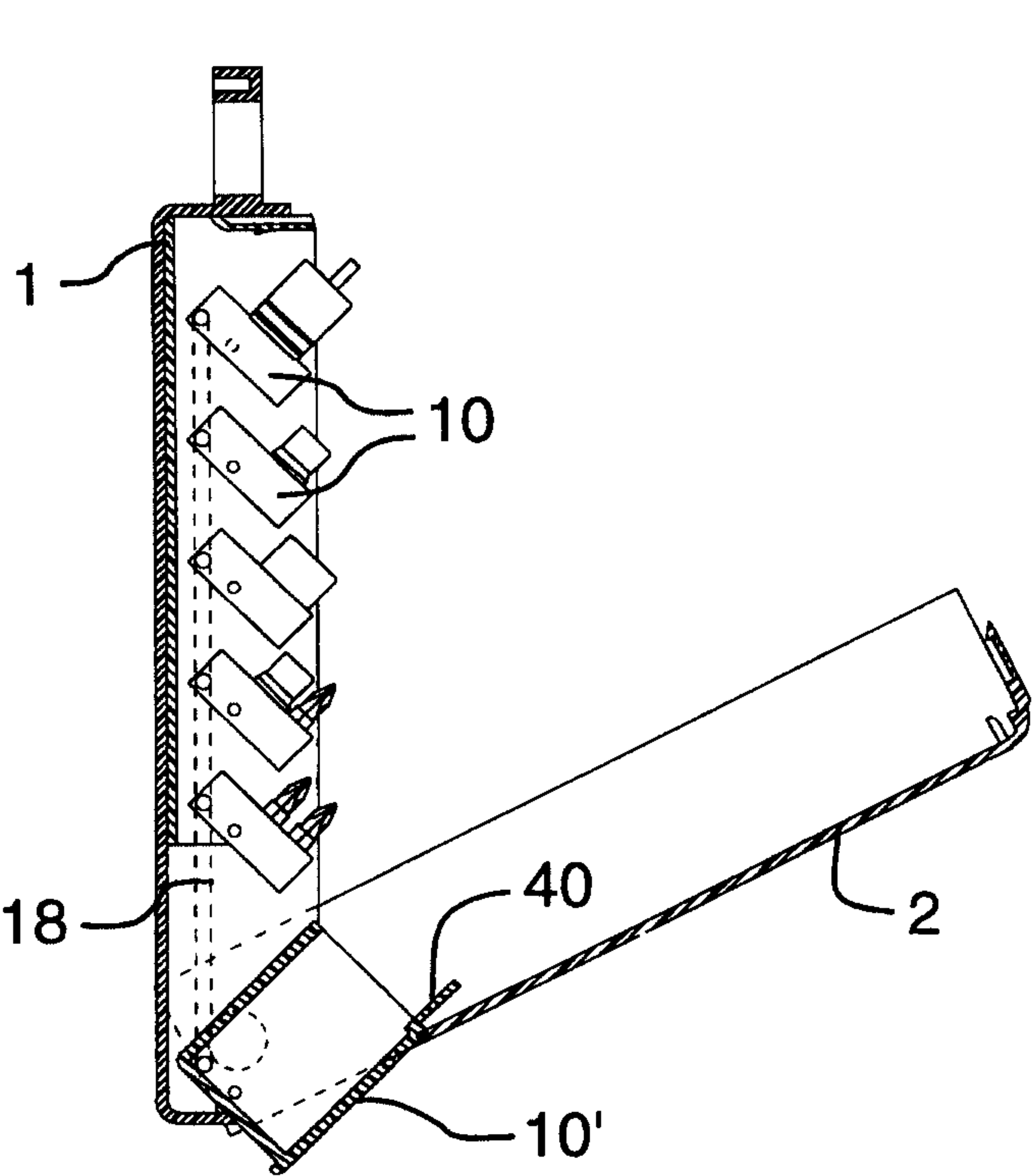


FIG. 16A

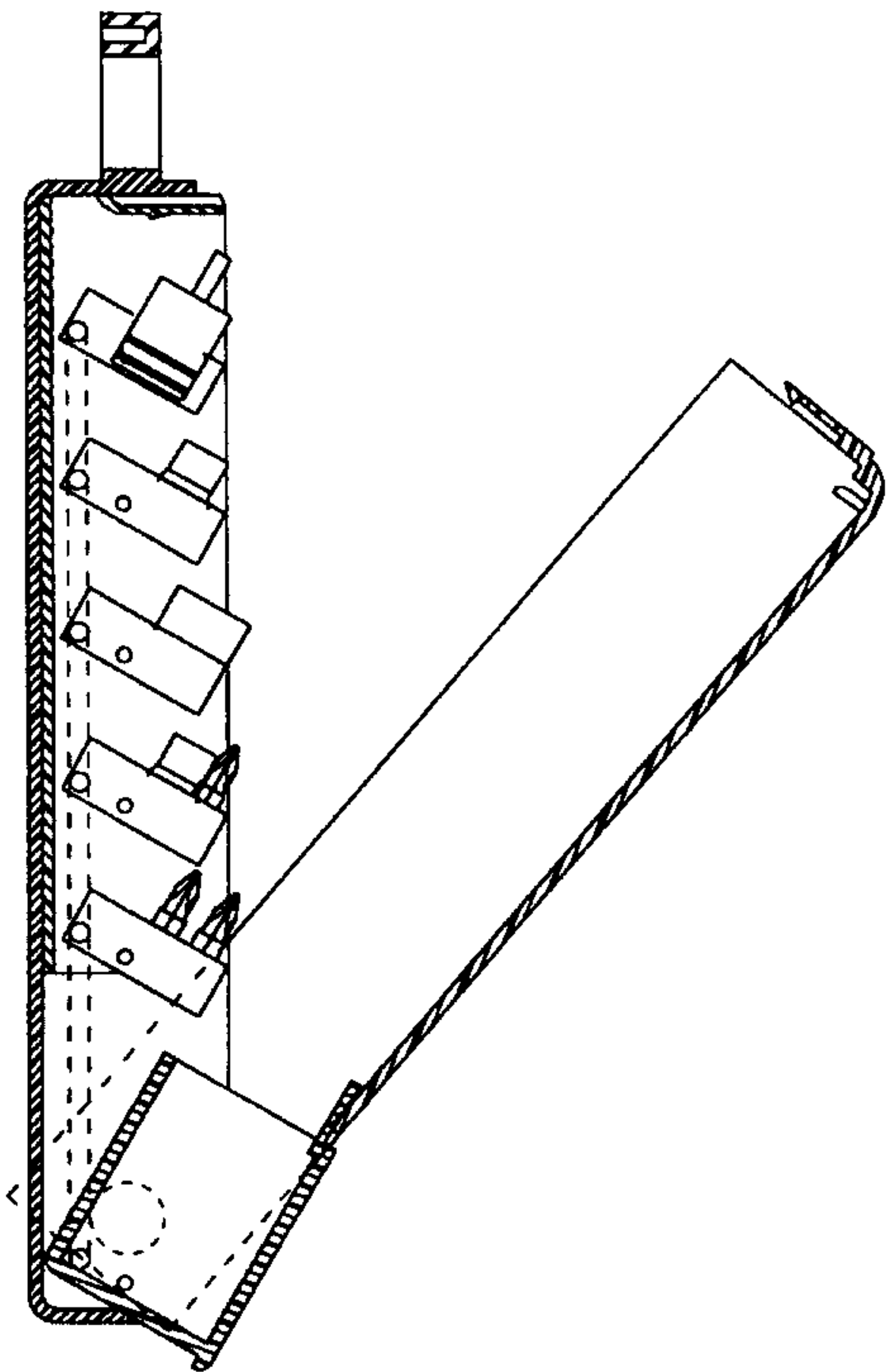


FIG. 16B

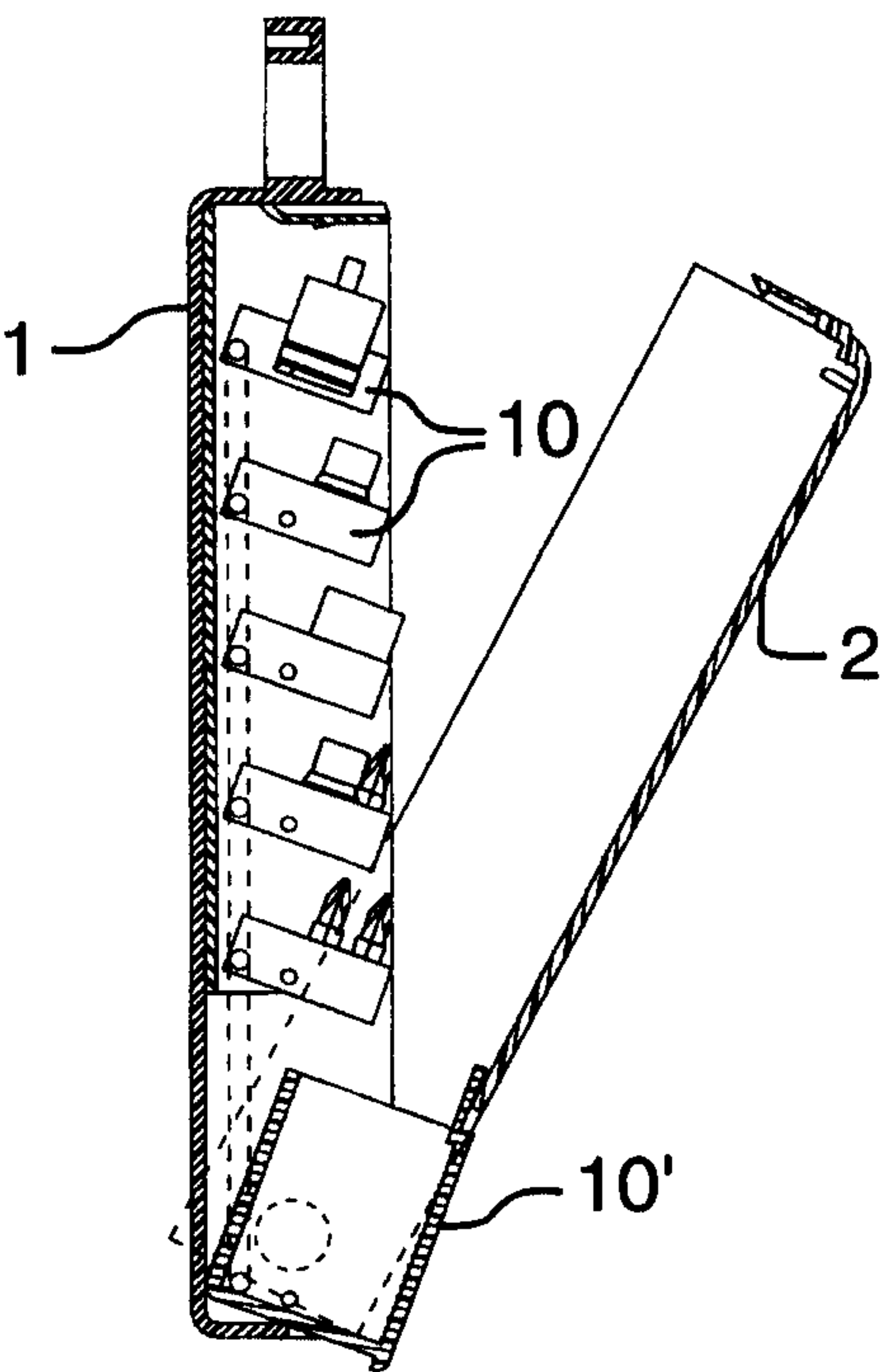


FIG. 16C

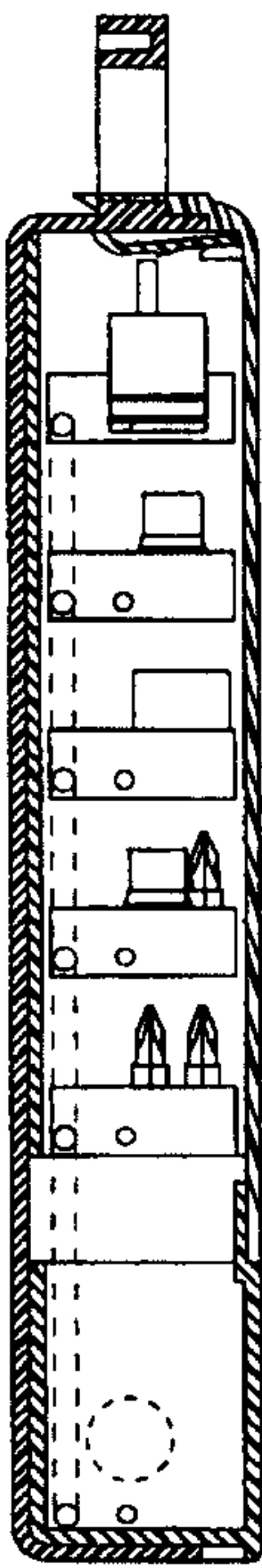


FIG. 16D

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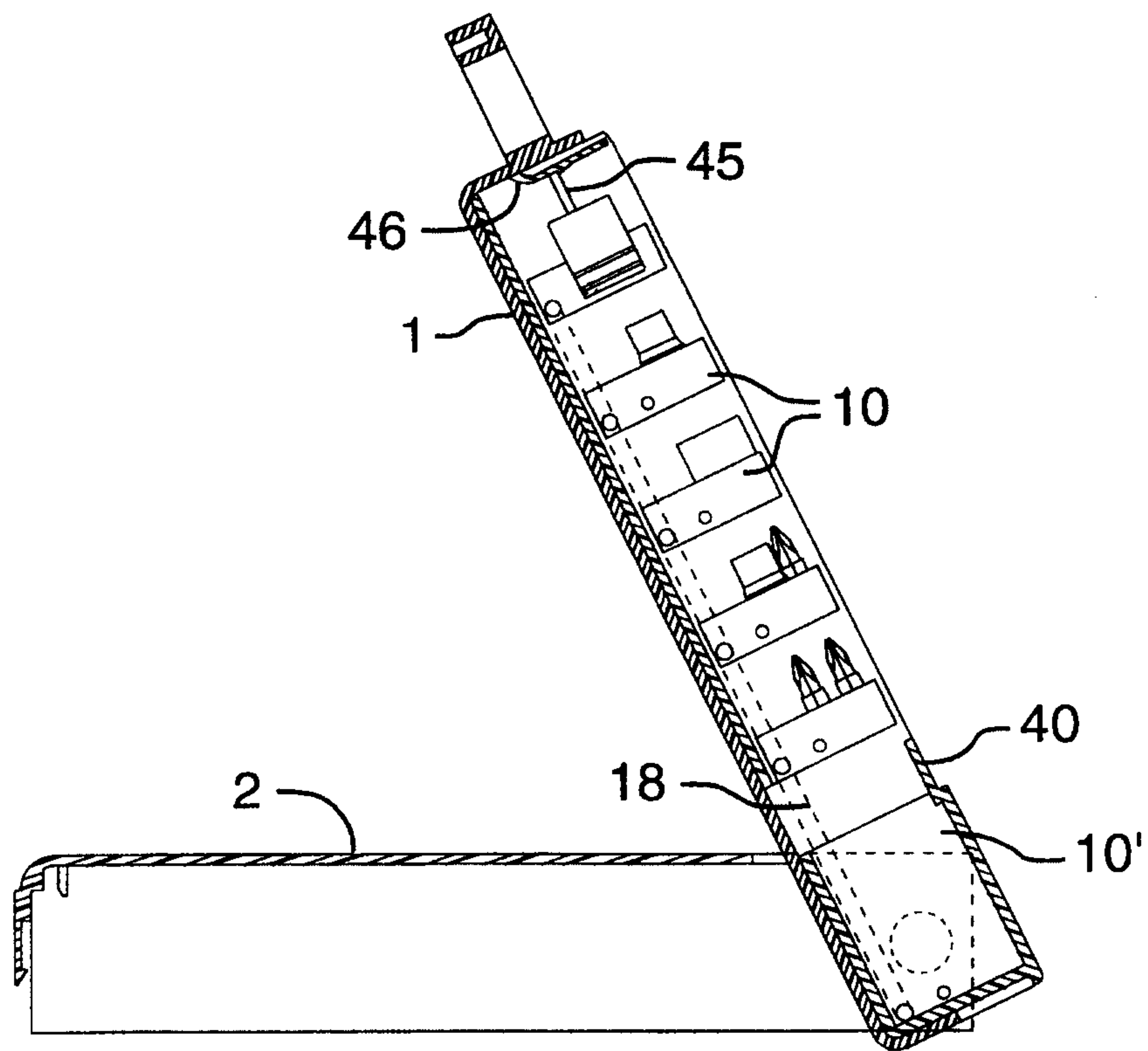


FIG. 17A

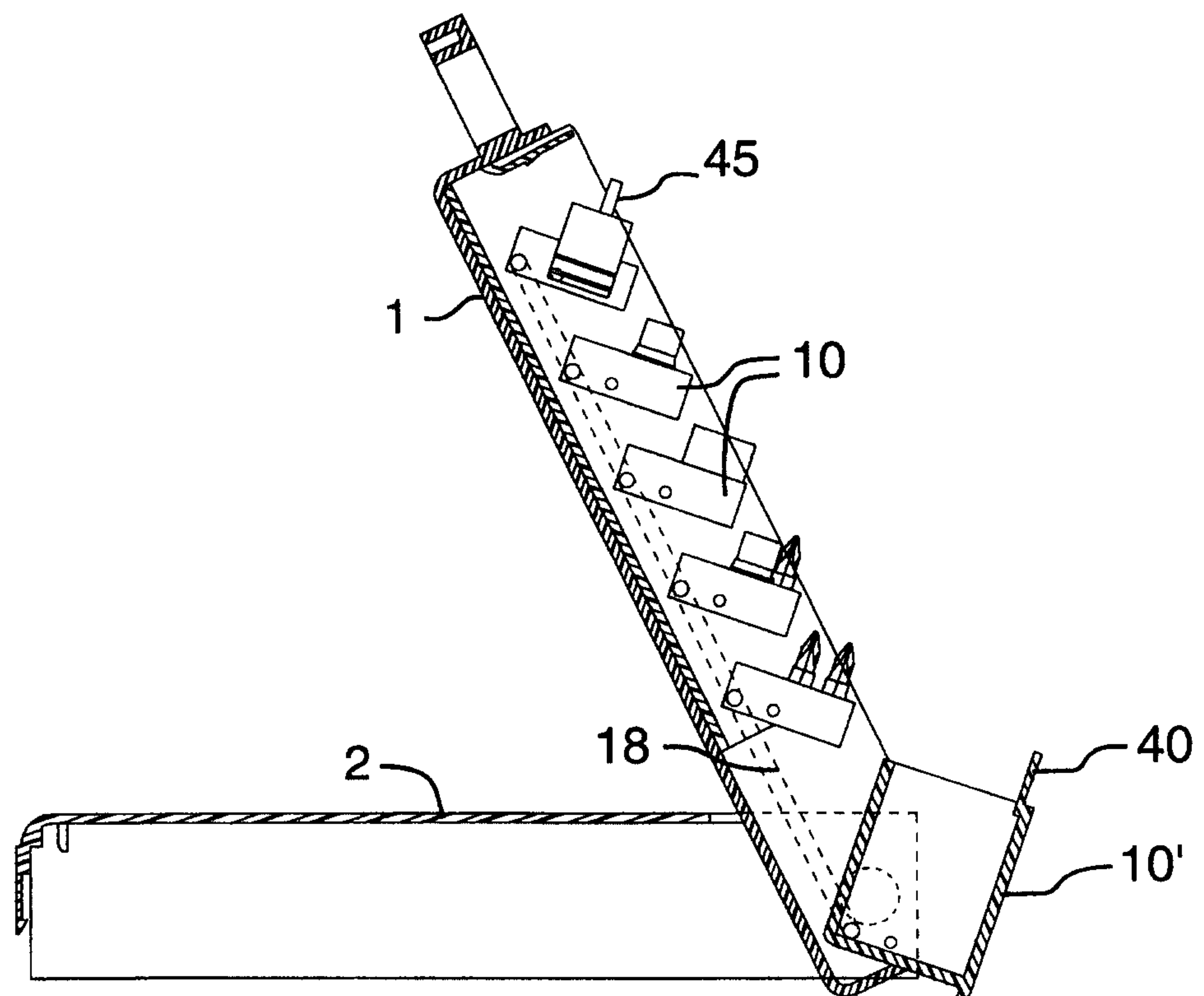


FIG. 17B

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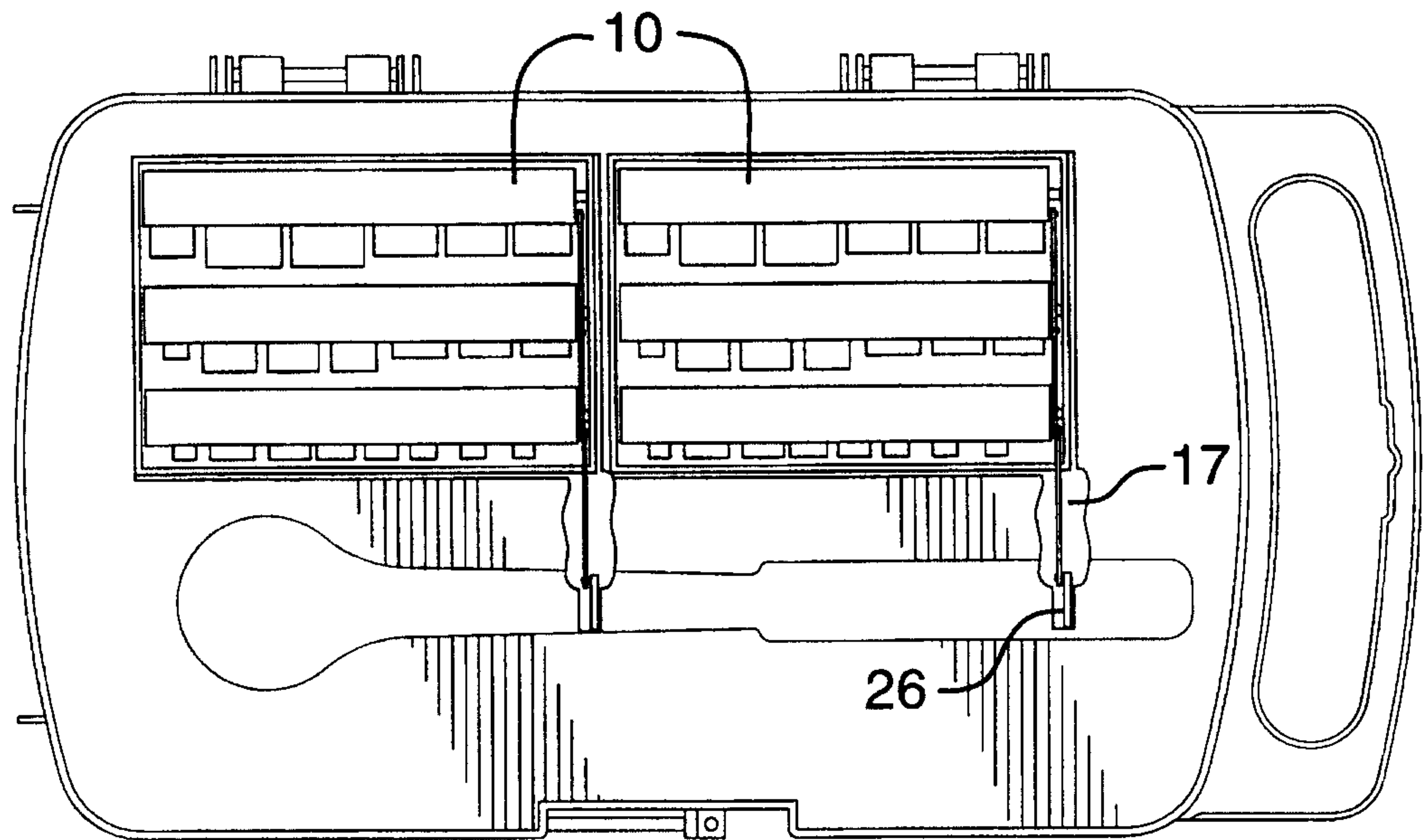


FIG. 18

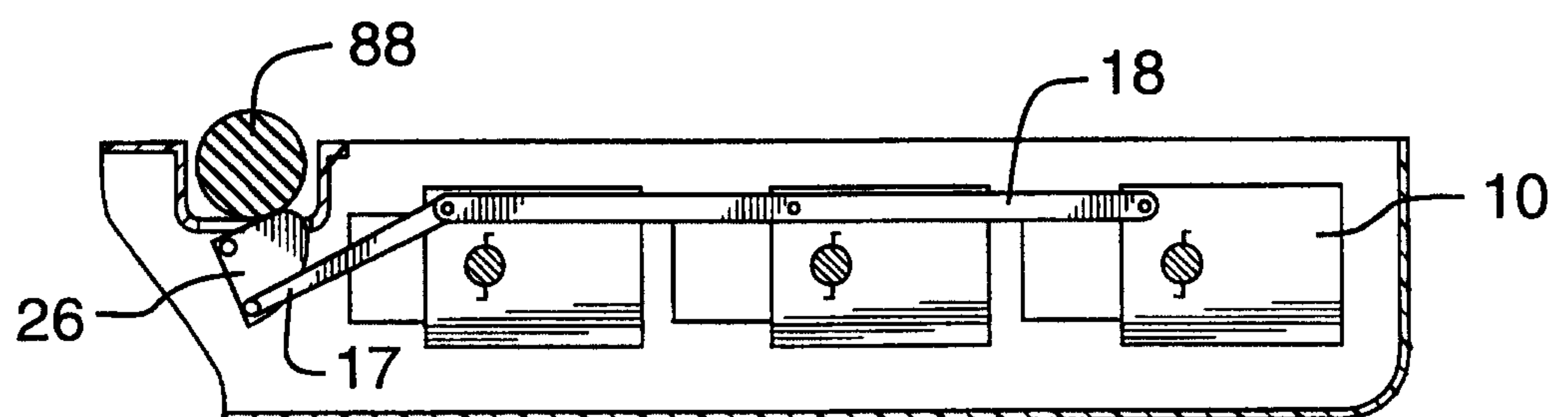


FIG. 19

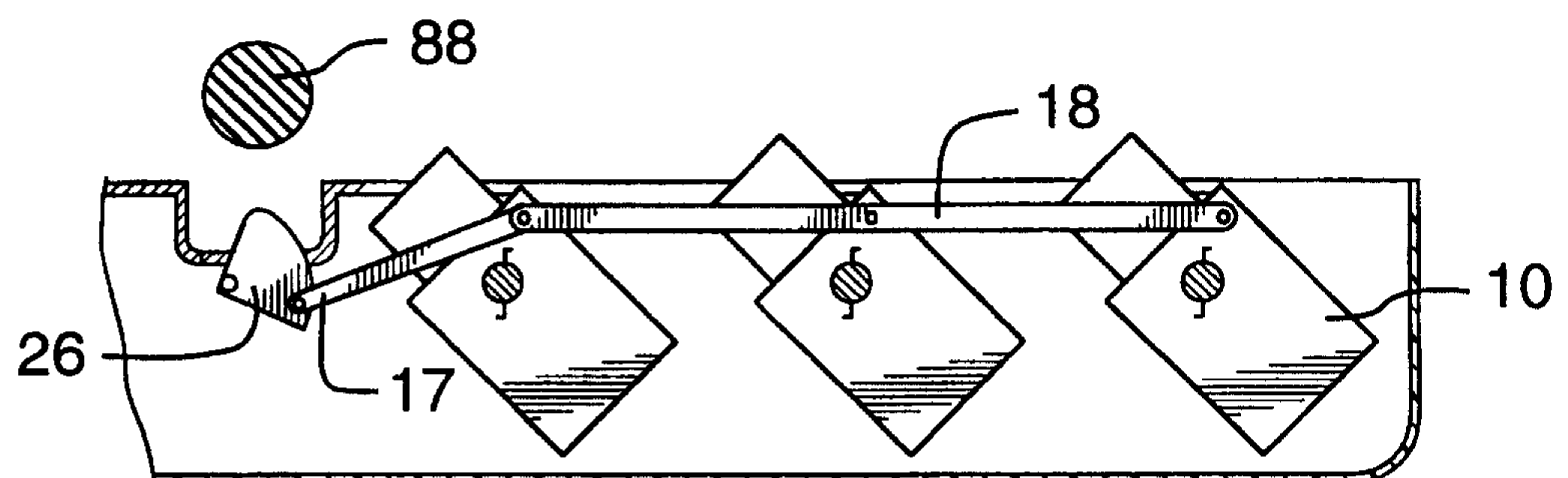


FIG. 20

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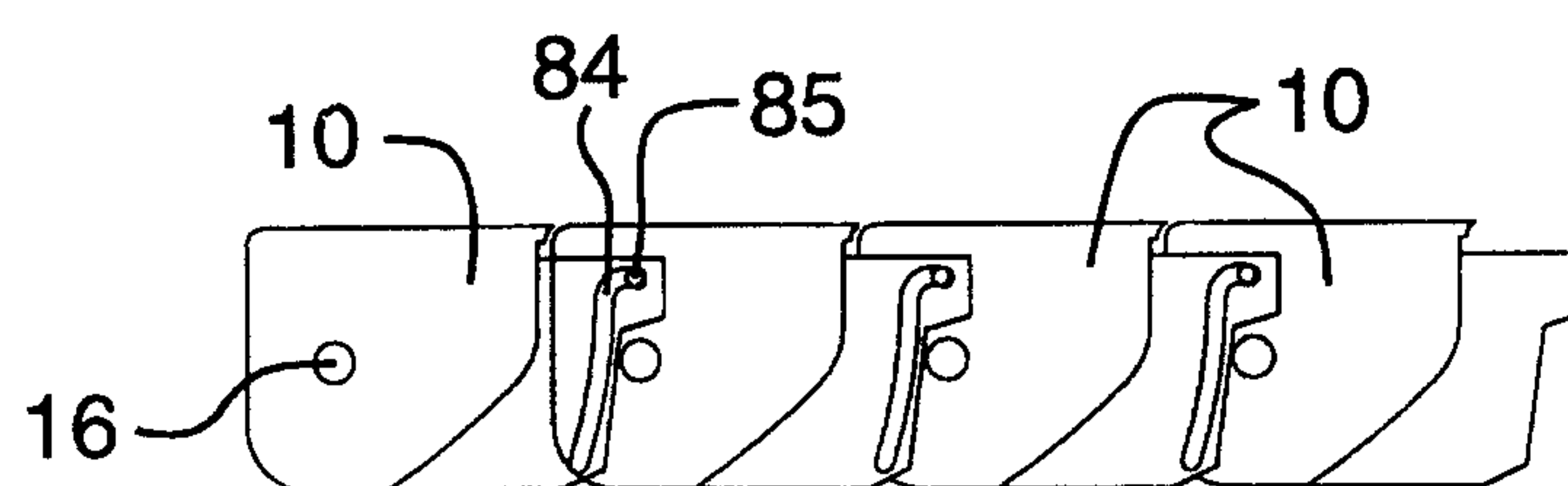


FIG. 21

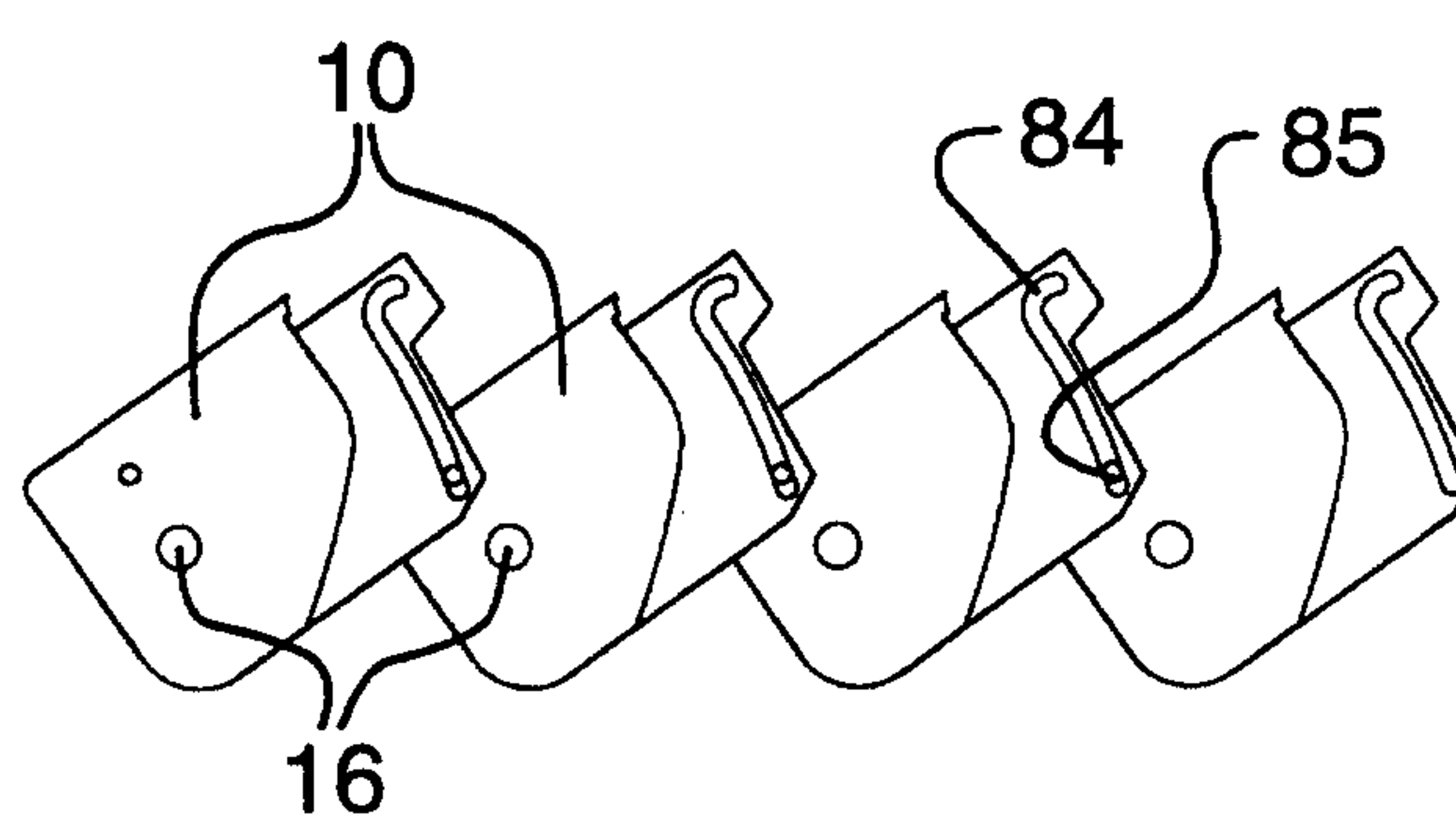


FIG. 22

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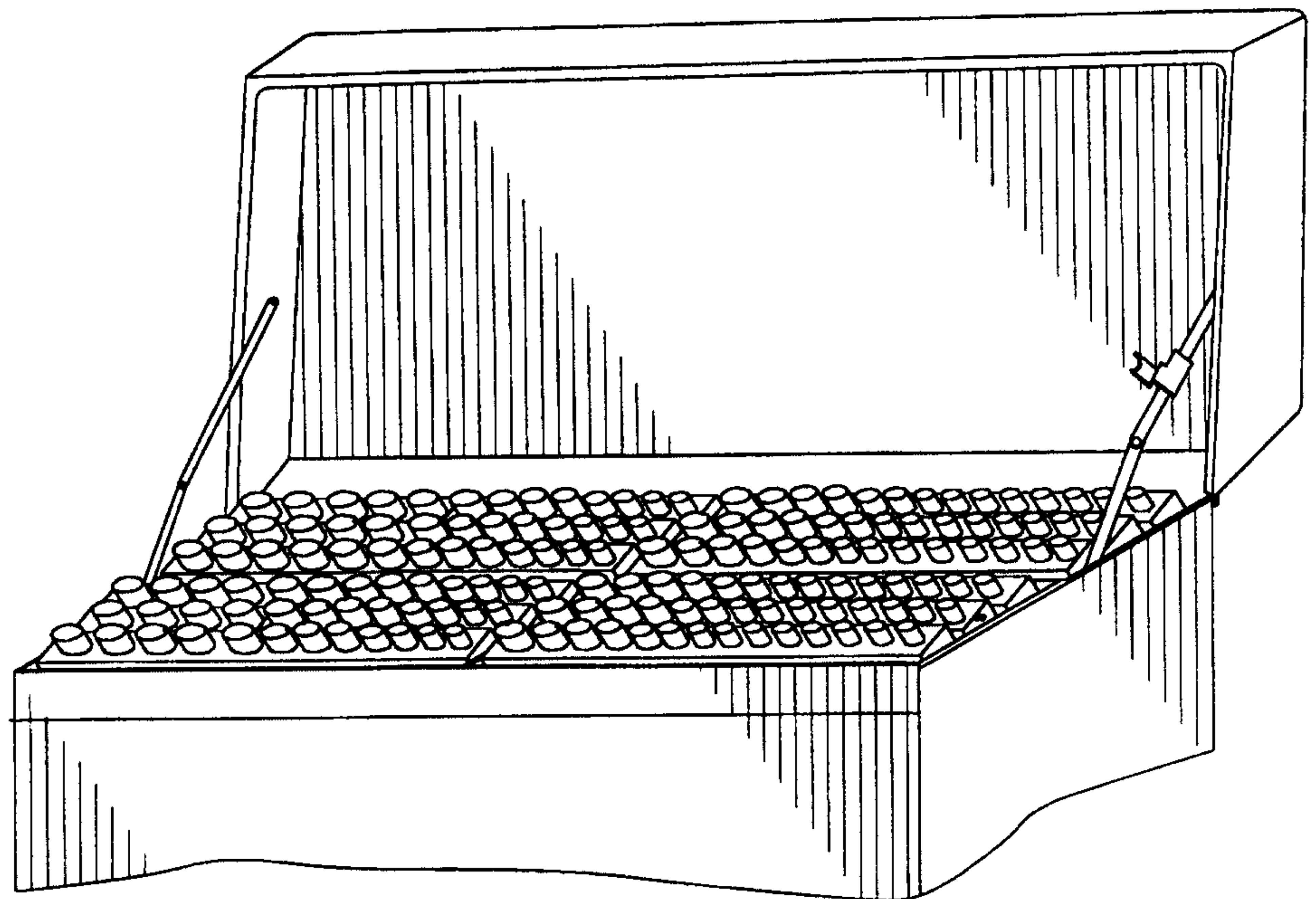


FIG. 23

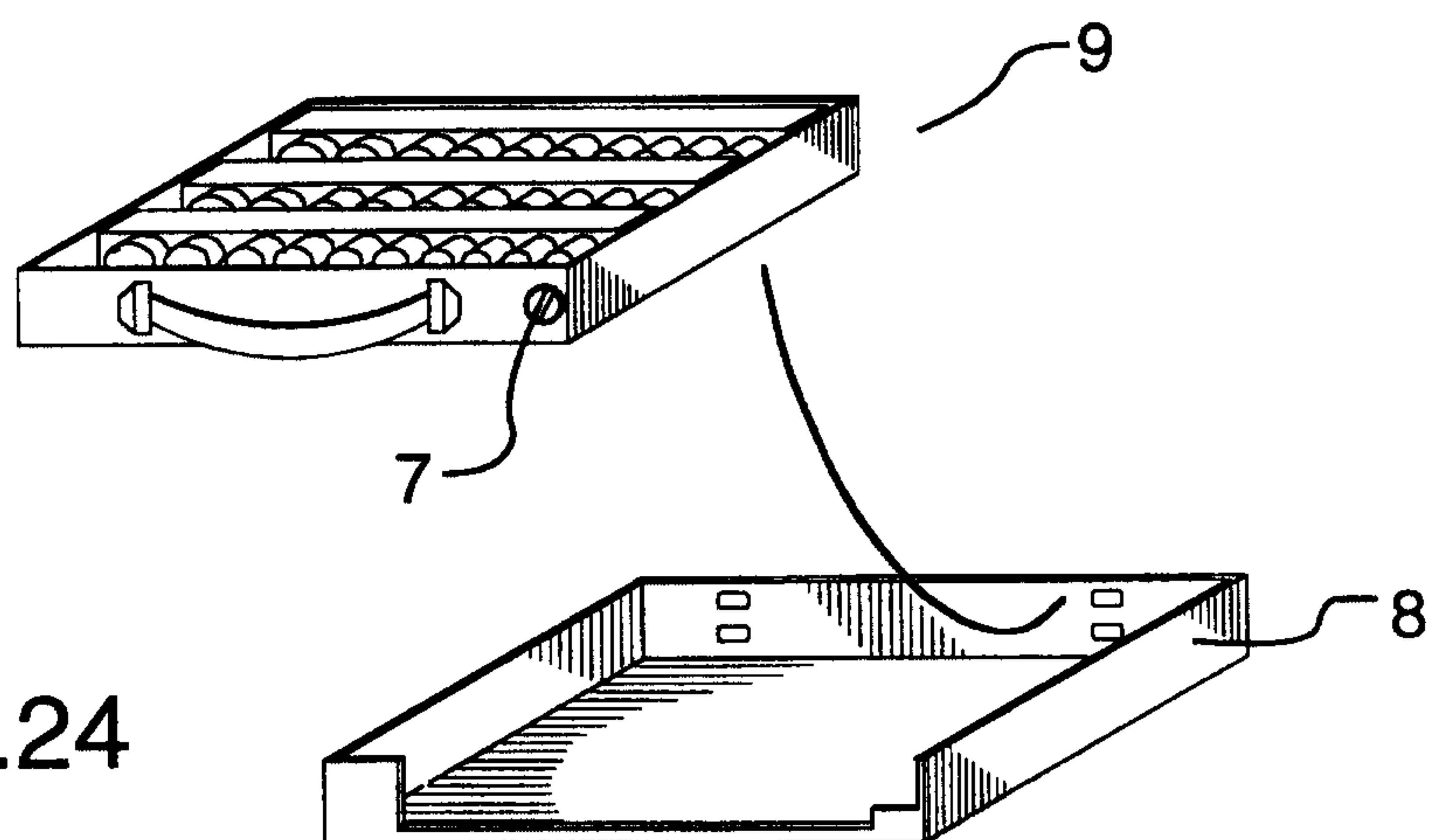


FIG. 24

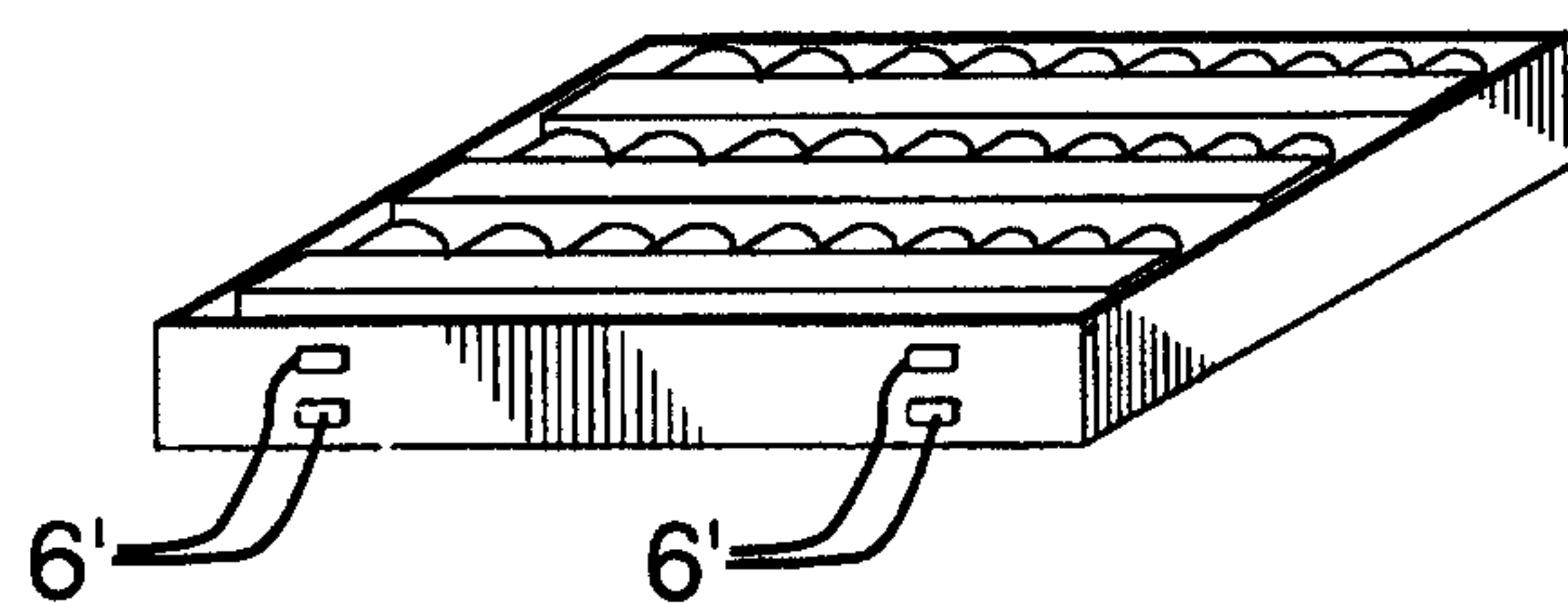


FIG. 24A

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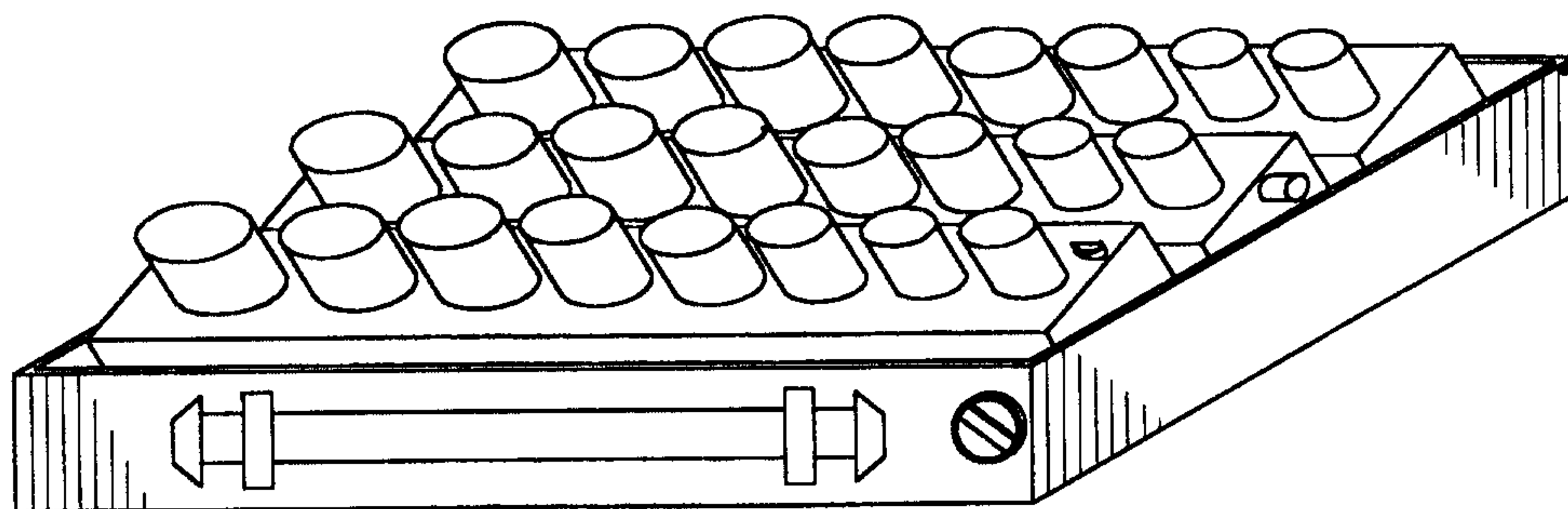


FIG. 25

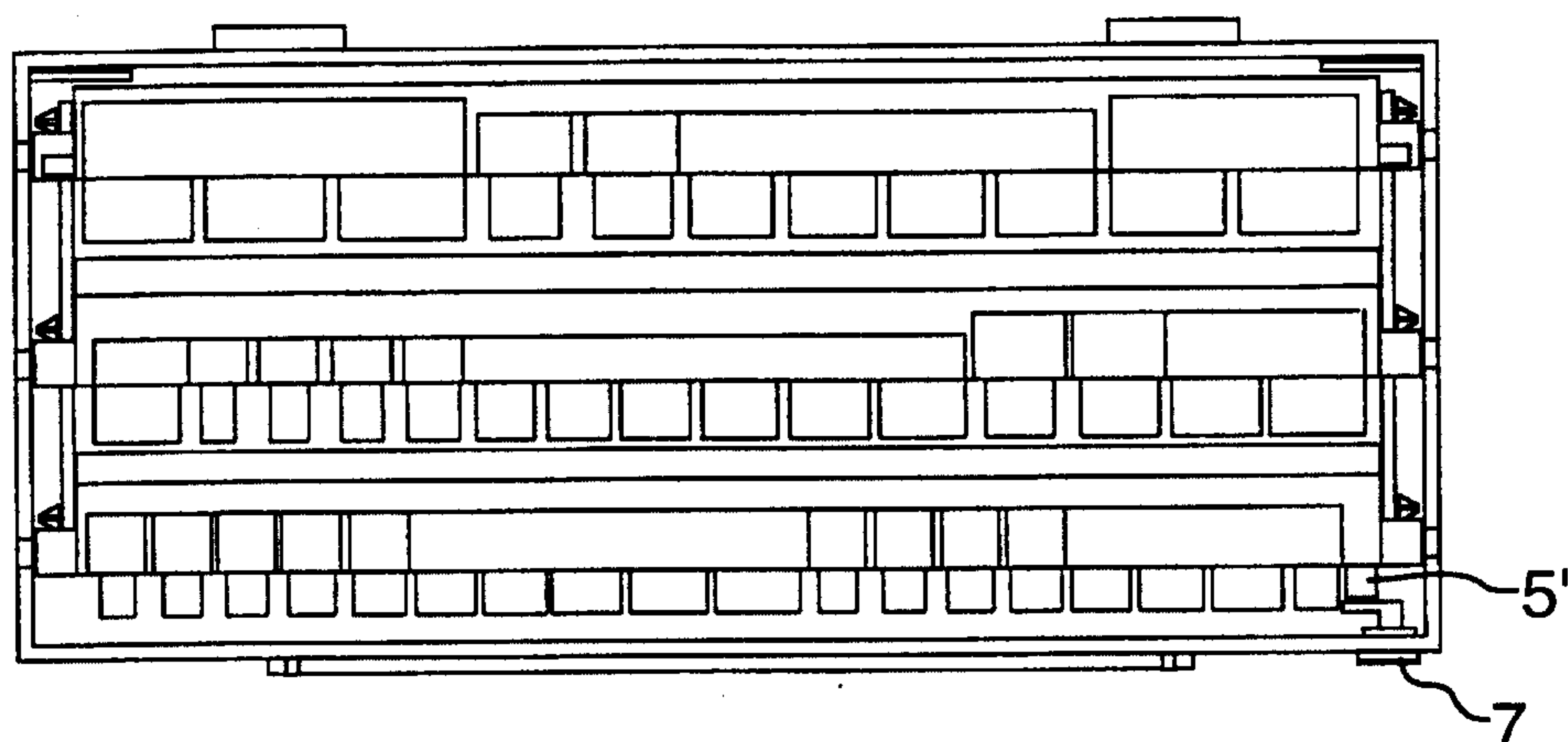


FIG. 26

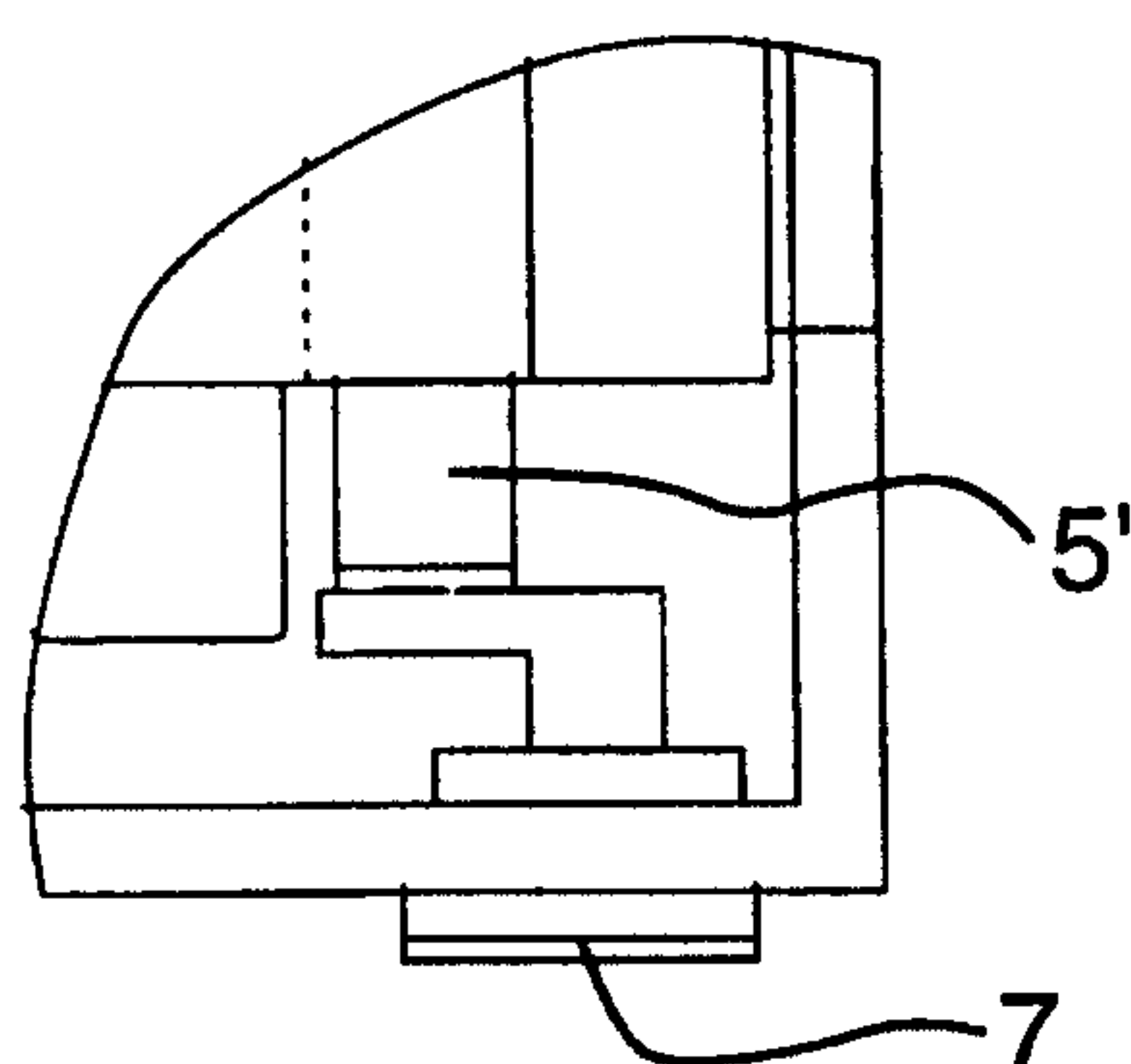


FIG. 27

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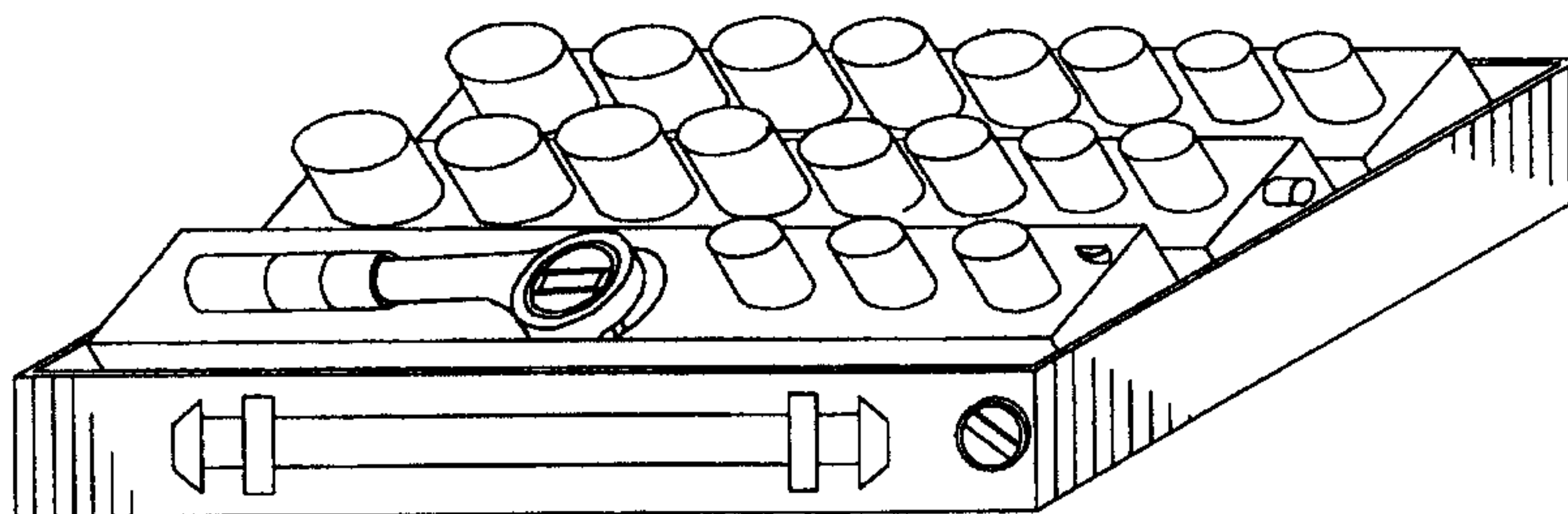


FIG. 28A

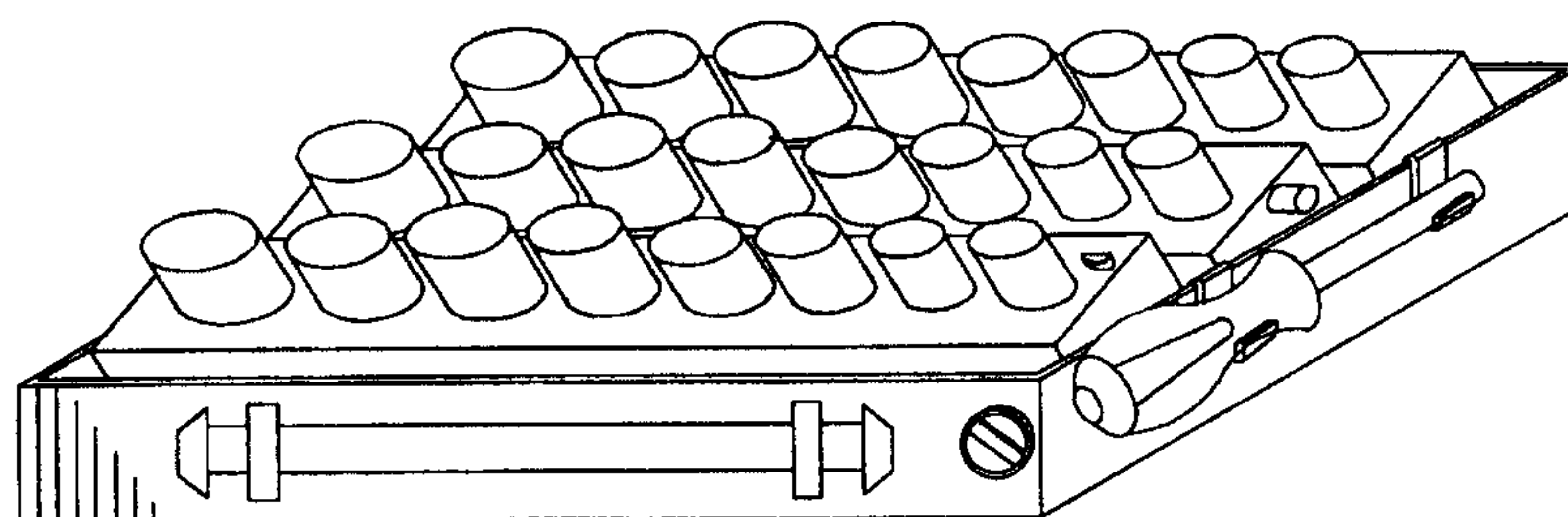


FIG. 28B