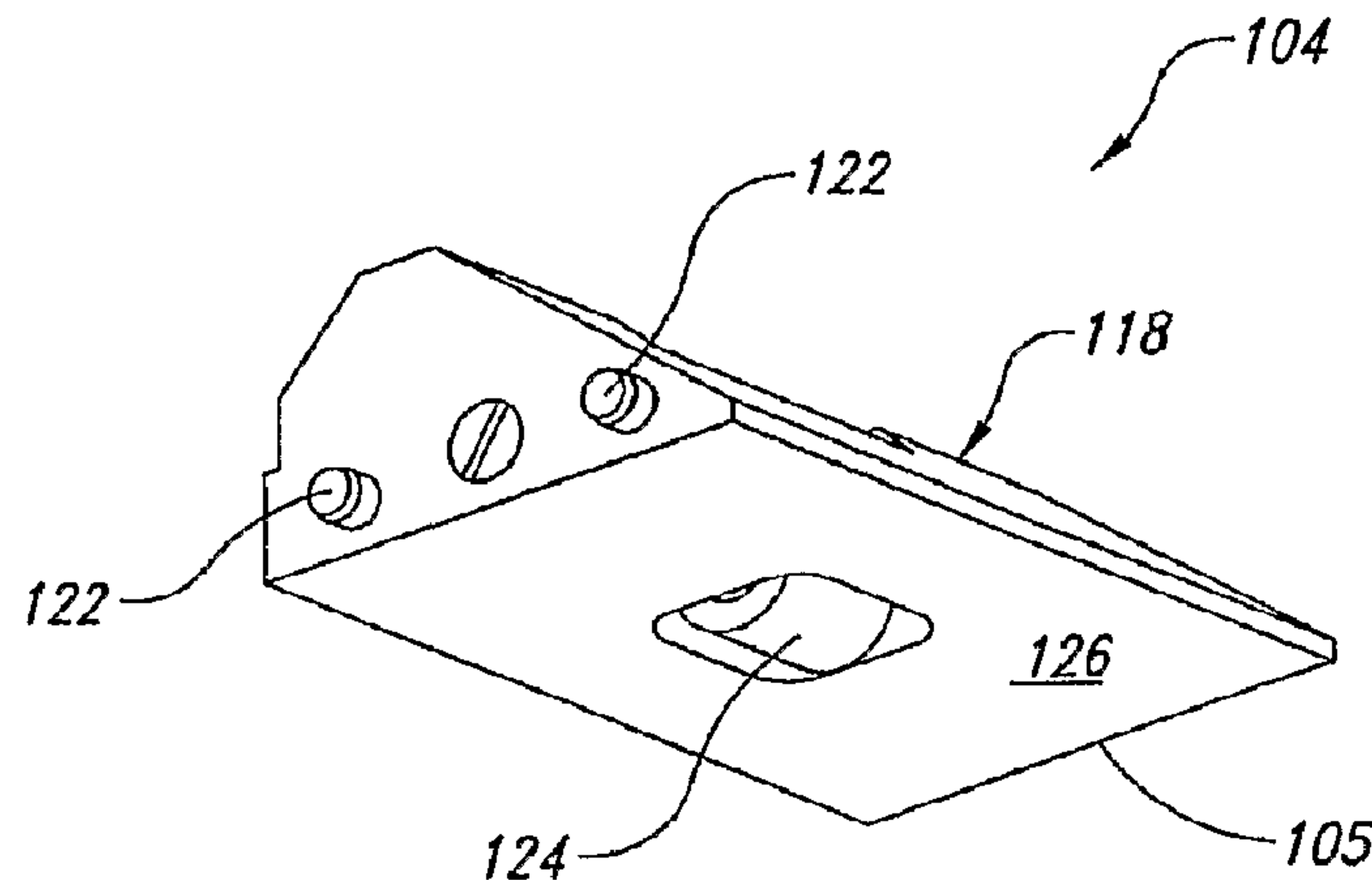




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(54) **Titre : SABOT A CARTES DOTE D'UN MECANISME DE RESISTANCE A LA FORCE**
(54) **Title: CARD SHOE WITH FORCE RESIST MECHANISM**



(57) **Abrégé/Abstract:**

A card shoe (100) for holding and distributing playing cards during a playing card game, where the card shoe can hold multiple decks of playing cards. The card shoe includes a wedge assembly (104) that biases playing cards toward a playing card extraction opening. Gravity and/or other forces, for example a spring force, may bias the wedge assembly. The wedge assembly includes a wedge block (105) and a roller subassembly (125). The roller subassembly includes a shaft (128), a clutch assembly (126), and a roller (124). In one embodiment, the clutch assembly and roller are mounted on an offset portion of the shaft so that the roller can be adjusted relative to a bottom of the wedge block. The clutch assembly permits the roller to roll in only one direction. The clutch assembly locks onto the shaft if a force is exerted which would tend to push the wedge block away from the playing card extraction opening.

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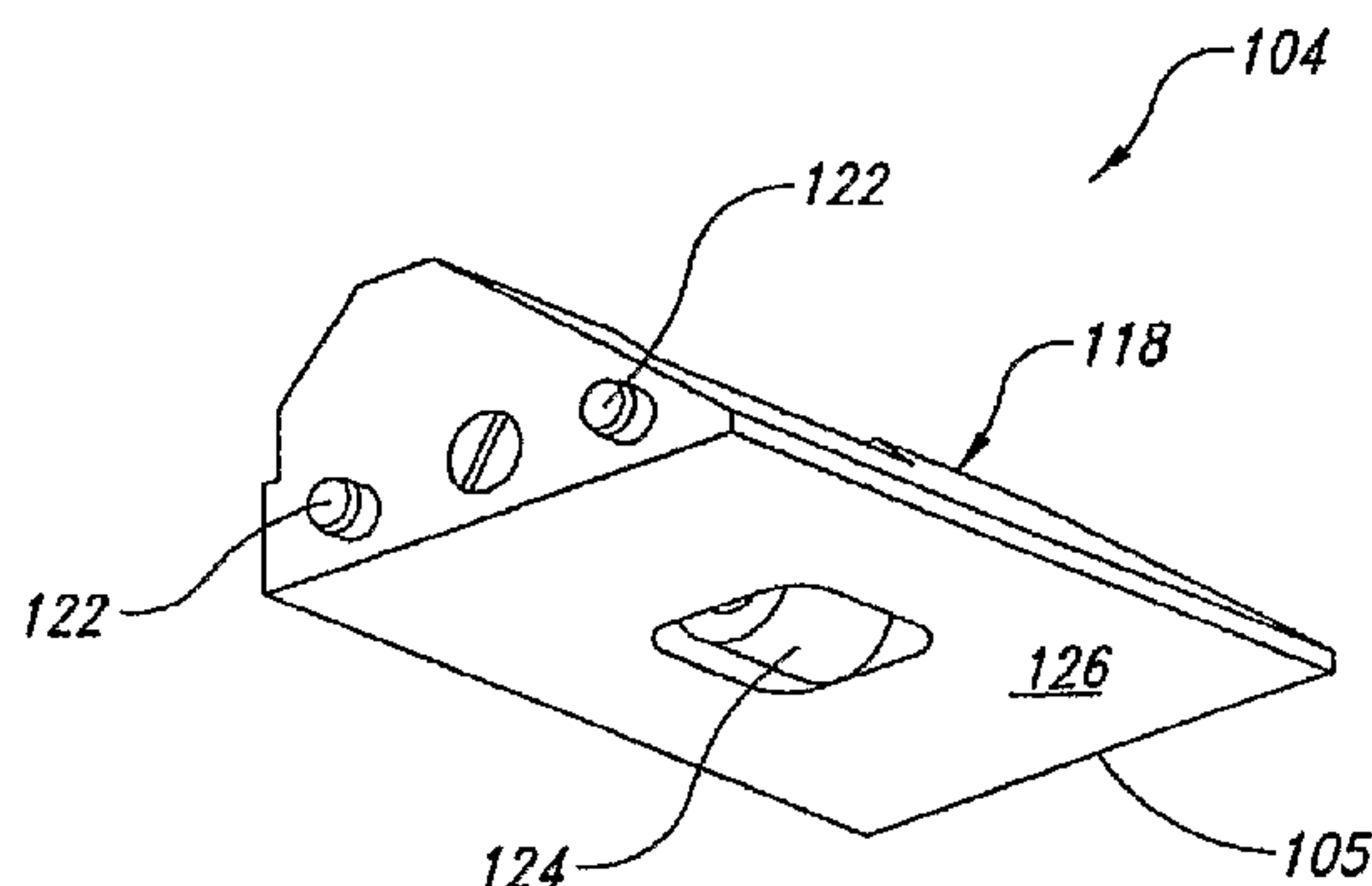
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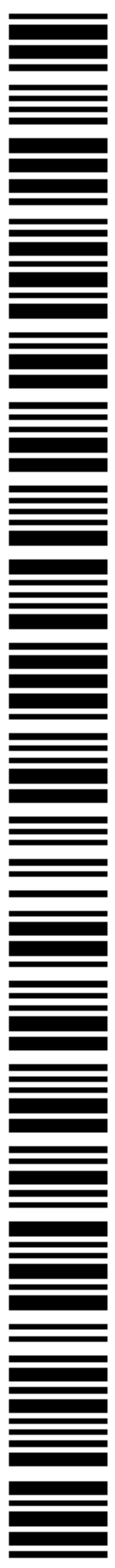
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(54) Title: CARD SHOE WITH FORCE RESIST MECHANISM



(57) Abstract: A card shoe (100) for holding and distributing playing cards during a playing card game, where the card shoe can hold multiple decks of playing cards. The card shoe includes a wedge assembly (104) that biases playing cards toward a playing card extraction opening. Gravity and/or other forces, for example a spring force, may bias the wedge assembly. The wedge assembly includes a wedge block (105) and a roller subassembly (125). The roller subassembly includes a shaft (128), a clutch assembly (126), and a roller (124). In one embodiment, the clutch assembly and roller are mounted on an offset portion of the shaft so that the roller can be adjusted relative to a bottom of the wedge block. The clutch assembly permits the roller to roll in only one direction. The clutch assembly locks onto the shaft if a force is exerted which would tend to push the wedge block away from the playing card extraction opening.



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CARD SHOE WITH FORCE RESIST MECHANISM

BACKGROUND OF THE INVENTION

Field of the Invention

This description generally relates to the field of table gaming, and more particularly to card holding devices, for example card shoes that hold a number of cards during a playing card game and allow cards to be extracted from the card shoe one at a time.

Description of the Related Art

Conventional card shoes 10 are typically sized to receive two to eight standard decks of playing cards, with fifty-two (52) playing cards per standard playing card deck.

Figure 1 shows a conventional, non-automated card shoe 10 that includes a housing 12, a playing card support surface 14, and a playing card wedge 16. The housing includes an opening 18 where playing cards are extracted one at a time during a playing card game. The housing 12 includes a playing card support surface 14 sloping at a downward angle 20 going from the rear of the housing 12 to the front. The playing card support surface 14 supports the playing cards and the playing card wedge 16. The playing card wedge 16 includes a slanted surface 22 that skews or offsets the playing cards in the housing 12 relative to one another. An optional roller 24 may be rotationally coupled to the playing card wedge 16 to allow the playing card wedge 16 to easily move down the playing card support surface 14. The playing cards are compressed between the slanted surface 22 of the playing card wedge 16 and a complementary, slanted front cover 26 of the housing 12. The downward angle 20 of the playing card support surface 14 takes advantage of gravity to bias the playing cards toward the front of the housing 12 under their own weight as well as under the weight of the playing card wedge 16.

Another type of card shoe, which is not illustrated, is similar to the above-described card shoe except that a spring couples the playing card wedge to the housing. The spring operates alone or to augment the force of gravity by applying a force to bias the playing card wedge toward the opening in the housing. As the playing card wedge moves closer to the opening, the spring contributes less and less to the overall force biasing the playing card wedge toward the opening. At some point, before all the playing cards are removed from the card shoe, the force of the spring biasing the playing card wedge toward the opening becomes nearly negligible. This situation typically occurs when there are less than two decks (*i.e.*, 104 playing cards) remaining in the card shoe.

For either of the above-described conventional card shoes, the amount of force biasing the playing cards toward the opening in the card shoe decreases as fewer cards remain in the card shoe. In the first described card shoe, the weight of the playing cards contributes significantly to the force biasing the playing cards toward the front of the card shoe. Consequently, removing the playing cards from the card shoe results in less resistance as the dealer applies finger pressure to remove a playing card from the card shoe. Likewise, the reduction in the biasing force applied by the spring in the second type of card shoe, also results in less resistance as the dealer applies finger pressure to remove a playing card from the card shoe.

The practical consequence of these conventional card shoes is that it becomes more difficult for the dealer to extract the remaining playing cards from the card shoe when there is little to no resistance or biasing force (*e.g.*, (wedge mass + card mass) or (wedge mass + spring force + card mass)) against the finger pressure applied on the playing card by the dealer. Thus, the dealer is often unable to firmly contact the playing card present in the opening of the housing, thus making it difficult for the dealer's finger to frictionally grip and withdraw the next playing card to be dealt. As the dealer pushes harder against the playing card, the wedge reacts by moving rearward in the housing,

further exacerbating the situation and causing the dealer to fish for the playing card in the card shoe. Accordingly, it would be desirable to have a card shoe that addresses the aforementioned problems and permits easier and smoother removal of the playing cards from the card shoe, without regard to the number
5 of playing cards remaining in the card shoe.

SUMMARY OF THE INVENTION

This description generally relates to a card shoes for holding and distributing playing cards during a playing card game. The card shoe typically holds between two (2) to eight (8) decks of playing cards. The card shoe
10 includes a wedge that biases the playing cards toward a playing card extraction opening in the card shoe. The wedge can be acted on by gravity, another mechanical mechanism, for example a spring, and/or both. The wedge may include a shaft, a clutch assembly, and a roller, where the clutch assembly permits the roller to rotate in only one direction. When the clutch assembly
15 locks onto the shaft, the wedge resists backward movement within the card shoe, which in turn allows a dealer to put pressure on the playing cards being extracted without pushing the wedge away from the playing card extraction opening.

In one aspect, a wedge assembly to bias playing cards toward a
20 playing card extraction opening of a card shoe includes a wedge block having a bottom surface and a card engagement surface positioned at an angle relative to the bottom surface, the wedge block receivable in the card shoe; and a roller subassembly having a roller rotationally coupled to the wedge block to be rotatable in a first rotational direction and lockable to substantially resist rotation
25 in a direction opposite the first rotational direction.

In another aspect, a wedge assembly to bias playing cards toward a playing card extraction opening of a card shoe includes a wedge block having a bottom surface and a card engagement surface positioned at an angle relative to the bottom surface, the wedge block receivable in the card shoe; and

a roller subassembly having a shaft and a roller, the shaft coupled to the wedge block and having a first portion concentrically disposed about a first shaft axis and a second portion eccentrically disposed about a second shaft axis, the roller coupled to the second portion of the shaft and rotatable about the second shaft axis.

5 In yet another aspect, a card shoe includes a housing having a playing card support surface and an opening, the playing card support surface arranged to receive and support a plurality of playing cards, the opening sized to permit extraction of at least some of the plurality of playing cards from the housing; and a wedge assembly having a wedge block and a roller subassembly, the wedge block includes a bottom surface and
10 a card engagement surface positioned at an angle relative to the bottom surface, the wedge block is receivable in the housing of card shoe, the roller subassembly includes a roller rotationally coupled to the wedge block and rotatable in a first rotational direction and lockable to substantially resist rotation in a direction opposite the first rotational direction.

15 In one illustrative embodiment, a wedge assembly to bias playing cards toward a playing card extraction opening of a card shoe includes a wedge block having a bottom surface and a card engagement surface positioned at an angle relative to the bottom surface. The wedge block is receivable in the card shoe. The wedge assembly further includes a roller subassembly having a roller rotationally coupled to the wedge block to
20 be rotatable in a first rotational direction in which playing cards are biased toward the playing card extraction opening at least partially under the force of gravity and lockable to substantially resist rotation in a direction opposite the first rotational direction.

 In another illustrative embodiment, a card shoe includes a housing having a playing card support surface and an opening. The playing card support surface is
25 arranged to receive and support a plurality of playing cards. The opening is sized to permit extraction of at least some of the plurality of playing cards from the housing. The card shoe further includes a wedge assembly having a wedge block and a roller subassembly. The wedge block includes a bottom surface and a card engagement surface positioned at an angle relative to the bottom surface, and the wedge block is
30 receivable in the housing of the card shoe. The roller subassembly includes a roller rotationally coupled to the wedge block and rotatable in a first rotational direction which

allows the wedge block to advance the playing cards towards the opening of the housing under a biasing force and lockable to substantially resist rotation in a direction opposite the first rotational direction to resist movement of the wedge block away from the opening of the housing without resisting a force of gravity on the wedge block.

5 Other aspects and features of illustrative embodiments will become apparent to those ordinarily skilled in the art upon review of the following description of such embodiments in conjunction with the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

10 In the drawings, identical reference numbers identify similar elements or acts. The sizes and relative positions of elements in the drawings are not necessarily drawn to scale. For example, the shapes of various elements and angles are not necessarily drawn to scale, and some of these elements are arbitrarily enlarged and positioned to improve drawing legibility. Further, the particular shapes of the elements as drawn, are
15 not intended to convey any information regarding the actual shape of the particular elements, and have been solely selected for ease of recognition in the drawings.

Figure 1 is an isometric, partially exploded view of a conventional card shoe having a card wedge, according to one illustrated embodiment.

20 Figure 2 is an isometric view of a card shoe having a wedge assembly and an opening for extracting playing cards from the card shoe, according to one illustrated embodiment.

Figure 3 is a top, front, left side isometric view of the wedge assembly of Figure 2 mounted to a roller subassembly.

25 Figure 4 is a bottom, front, left side isometric view of the wedge assembly of Figure 2.

Figure 5 is a cross-sectional view of the roller subassembly of the wedge assembly, according to one illustrated embodiment where the roller subassembly includes a shaft, a clutch assembly, and roller mounted on the shaft.

30 Figure 6 is a cross-sectional view of the shaft of Figure 5 illustrating an offset portion of the shaft in further detail.

Figure 7 is a right side plan view of the shaft of Figure 6.

Figure 8 is a cross-sectional view of the card shoe taken along line 8-8 of Figure 2.

5

DETAILED DESCRIPTION OF THE INVENTION

10 In the following description, certain specific details are set forth in order to provide a thorough understanding of various embodiments of the invention. However, one skilled in the art will understand that other embodiments may be practiced without these details. In other instances, well-known structures associated with card shoes have not been shown or described in detail to avoid unnecessarily obscuring the description.

15 Unless the context requires otherwise, throughout the specification and claims which follow, the word "comprise" and variations thereof, such as, "comprises" and "comprising" are to be construed in an open, inclusive sense, that is as "including, but not limited to."

Reference throughout this specification to “one embodiment” or “an embodiment” means that a particular feature, structure or characteristic described in connection with the embodiment is included in at least one embodiment. Thus, the appearances of the phrases “in one embodiment” or “in
5 an embodiment” in various places throughout this specification are not necessarily all referring to the same embodiment. Furthermore, the particular features, structures, or characteristics may be combinable in any suitable manner in one or more embodiments.

The headings provided herein are for convenience only and do
10 not interpret the scope or meaning of the claimed invention.

This description generally relates to card shoes for holding and distributing playing cards during a playing card game. Card shoes are generally used in casinos and often hold between two (2) to eight (8) decks of playing cards. However, it is understood that some card shoes may hold a
15 fewer or a greater number of playing cards. Further, some card shoes may be automated, employing electro-mechanical and/or electro-optical components to read machine-readable and/or human readable indicia carried by the playing cards.

Figure 2 shows a card shoe 100 having a housing 102 and a
20 wedge assembly 104, according to the illustrated embodiment. The housing 102 includes a playing card support surface 106, sidewalls 108, and a front cover 110. The playing card support surface 106, the sidewalls 108, and the front cover 110 form a receptacle 111 configured to receive and support a number of playing cards (not shown). The playing card support surface 106
25 may or may not slope downward from the rear of the housing 102. As noted above, a sloped surface may take advantage of gravity as the sole or partial biasing force that urges the playing cards toward the opening 112 of the housing 102.

The front cover 110 includes an opening 112 from which a dealer
30 can extract the playing cards from the card shoe 100. The opening 112 is sized

to allow the dealer to place a finger or two onto the next playing card that is to be removed from the card shoe 100. The playing card support surface 106 can cooperate with the front cover 110 to skew or otherwise offset the playing cards relative to one another, which tends to increase the likelihood that playing cards
5 are extracted one at a time from the card shoe 100. It is understood that sometimes, however, more than one playing card is extracted from the card shoe 100, whether done intentionally or because two playing cards become stuck together.

The housing 102 further includes a slot or track 114. The track
10 114 can be sloped or otherwise configured to cause the wedge assembly 104 to move forward, toward the opening 112. One embodiment of the sloped track 114 is best illustrated in Figure 7. A spring 116 may be coupled to guides 117, 119 received in the track 114. The guides 117 may be fixed to the housing, whereas the guides 119 couple the wedge assembly 104 to the spring 116 and
15 are operable to move along the track 114. In one embodiment, the spring 116 is an extension spring anchored proximate the front of the housing 102 that biases or urges the wedge assembly 104 toward the opening 112. In another embodiment, the spring is a compression spring anchored proximate the rear of the housing 102 that biases or urges the wedge assembly 104 toward the
20 opening 112.

Figures 3 and 4 show the wedge assembly 104 having a wedge block 105 configured with a sloped engagement surface 118 disposed between first and second side surfaces 120. The wedge assembly 104 further includes guides 119, 122 extending from each of the first and second surfaces 120. The
25 guides 119 are coupled to the spring 116 (Figure 2) and may also be supported in the track 114 of the housing 102 as mentioned above. The guides 122 may also be supported in the track 114 of the housing 102 counteracting any overturning moment that may cause the wedge assembly 104 to rotate about the guides 119. Figure 4 shows a roller 124 of a roller subassembly 125, which

is part of the wedge assembly 104, extending at least slightly below a bottom surface 126 of the wedge block 105.

Figure 5 shows the roller subassembly 125 in detail. The roller subassembly 125 includes the roller 124, which is rotatably fixed to an anti-reversing clutch assembly 126, which in turn is rotatably coupled to a shaft 128. In one embodiment, the roller 124 is made from a urethane material and press fit onto the clutch assembly 126. The clutch assembly 126 may be an overrunning clutch or drawn cup roller clutch, such as or similar to those described in U.S. Patent Nos. 3,994,377; 3,993,177; 3,993,176; 3,990,555; 3,972,573; 3,942,616; 3,937,312; and 3,937,311. This type of clutch assembly 126 permits the roller 124 to freely rotate in a first direction, yet positively locks onto the shaft 128 to substantially prevent reverse rotation (*i.e.*, rotation that is counter or opposite to the first rotational direction) of the roller 124.

The shaft 128 includes a tool engagement portion 130 and a shaft centerline or axis 132. It is understood and appreciated that the shaft centerline 132 is to be distinguished from a roller rotational centerline or axis 133, as illustrated and described in more detail below. During operation, the roller 124 and portions of the clutch assembly 126 rotate in unison on the shaft 128 and about the roller rotational axis 133. In the illustrated embodiment, the shaft 128 does not rotate relative to the wedge assembly 104.

Figures 6 and 7 show the shaft 128 having a first section 134, a second section 136, and a third section 138, where the second section 136 is disposed between the first and third sections 134, 138. In the illustrated embodiment, the second section 136 is offset relative to the shaft axis 132 and concentrically formed about the roller rotational axis 133. The first and third sections 134, 138 are not offset, which means these sections are concentrically formed about the shaft axis 132. The eccentricity of the second section 136 is indicated by identifying that a first radial depth 140 of the second section 136 extends less than a second radial depth 142 on an opposite side (*i.e.*, 180 degrees) of the second section 136. Since both radial depths 140, 142 are

measured from the shaft axis 132, it is understood that the second section 136 must be eccentrically formed about and/or offset relative to the shaft axis 132. The radial depths 140, 142 vary in height about the circumference of the second section 136 of the shaft 128.

5 The first section 134 and the third section 138, on the other hand, are concentrically formed about and/or not offset relative to the shaft axis 132. The radial depths 144, 146, which are measured from the shaft axis 132 are equivalent, thus it is understood that the first section 134 and the third section 138 are concentric with respect to the shaft axis 132 and with respect to one
10 another.

One purpose for eccentrically offsetting the second section 136 is to allow for the adjustment of the roller 124 beyond the bottom surface 126 of the wedge block 105 (Figure 4). Adjusting the roller 124 to protrude by a lesser or greater amount beyond the bottom surface 126 is accomplished by engaging
15 the tool engagement portion 130 of the shaft 128 with an appropriate tool, for example a screwdriver. Because the shaft 128 is fixed to the wedge assembly 104, the roller 124 and portions of the clutch assembly 126 rotate about the second section 136 of the shaft 128.

Figure 8 shows the card shoe 100 as the wedge assembly 104 is
20 moved along the track 114. As the dealer removes each playing card, the biasing force of the spring 116, the weight of the wedge assembly 104, and/or the weight of the playing cards urges the wedge assembly 104 toward the front cover 110. The roller 124 is free to rotate in a direction indicated by the arrow 148. As the dealer applies pressure to the next card to be removed, the
25 anti-reversing clutch assembly 126 positively locks onto the shaft 128 to substantially prevent reverse rotation of the roller 124 and thus prevents the wedge assembly 104 from moving away from the front cover 110 and the opening 112 of the housing 102. The second section 136 of the shaft 128 and the frictional engaging portion of the clutch assembly 126 may be relatively

dimensioned to achieve a desired amount of frictional locking of the clutch assembly 126 onto the second section 136 of the shaft 128.

Once all or a desired number of cards are removed from the card shoe 100, the wedge assembly 104 can be reset in the card shoe 100. In one embodiment, the wedge
5 assembly 104 includes a handle 150 that can be used to separate the roller 124 from the playing card support surface 106 of the card shoe 100. By lifting up on the handle 150, the roller 124 will no longer be in contact with the playing card support surface 106 and the wedge assembly 104 can be easily moved away from the front cover 110 and the opening 112 to allow more playing cards to be loaded in the receptacle 111 of the
10 card shoe 100.

These and other changes can be made to illustrative embodiments in light of the above-detailed description. In general, in the following claims, the terms used should not be construed to limit the invention to the specific embodiments disclosed in the specification and the claims, but should be construed to include all card shoes usable in
15 accordance with the claims. Accordingly, the invention is not limited by the disclosed embodiments, but instead its scope is to be determined entirely by the following claims.

**THE SUBJECT-MATTER OF THE INVENTION FOR WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED IS DEFINED AS FOLLOWS:**

1. A wedge assembly to bias playing cards toward a playing card
5 extraction opening of a card shoe, the wedge assembly comprising:
a wedge block having a bottom surface and a card engagement surface
positioned at an angle relative to the bottom surface, the wedge block receivable in the
card shoe; and
a roller subassembly having a roller rotationally coupled to the wedge
10 block to be rotatable in a first rotational direction in which playing cards are biased
toward the playing card extraction opening at least partially under the force of gravity
and lockable to substantially resist rotation in a direction opposite the first rotational
direction.
- 15 2. The wedge assembly of claim 1, further comprising:
a number of guides extending outwardly from wedge block to engage
complementary structure on the card shoe.
3. The wedge assembly of claim 1 wherein the angle between the
20 card engagement surface and the bottom surface of the wedge block is an acute angle.
4. The wedge assembly of claim 1, further comprising:
a shaft coupled to the wedge block, wherein the shaft includes a first
portion concentrically disposed about a first shaft axis and a second portion
25 eccentrically disposed about a second shaft axis.
5. The wedge assembly of claim 4 wherein the roller is rotationally
coupled to one of the first or the second portions of the shaft.

6. The wedge assembly of claim 1 wherein a portion of the roller extends a distance beyond the bottom surface of the wedge block, the distance being adjustable.

5 7. The wedge assembly of claim 1, further comprising:
a handle coupled to the wedge block.

8. The wedge assembly of claim 7 wherein the handle is positioned on a rear portion of the wedge block.

10

9. The wedge assembly of claim 1, further comprising:
a clutch assembly coupling the roller to the wedge block, wherein the clutch assembly is lockable onto the shaft when the roller is urged in the direction opposite the first rotational direction.

15

10. A card shoe comprising:
a housing having a playing card support surface and an opening, the playing card support surface arranged to receive and support a plurality of playing cards, the opening sized to permit extraction of at least some of the plurality of playing
20 cards from the housing; and

a wedge assembly having a wedge block and a roller subassembly, the wedge block includes a bottom surface and a card engagement surface positioned at an angle relative to the bottom surface, the wedge block is receivable in the housing of the card shoe, the roller subassembly includes a roller rotationally coupled to the wedge
25 block and rotatable in a first rotational direction which allows the wedge block to advance the playing cards towards the opening of the housing under a biasing force and lockable to substantially resist rotation in a direction opposite the first rotational direction to resist movement of the wedge block away from the opening of the housing without resisting a force of gravity on the wedge block.

30

11. The card shoe of claim 10, further comprising:

a number of guides extending outwardly from wedge block to engage complementary structure on the card shoe.

5 12. The card shoe of claim 10 wherein the angle between the card engagement surface and the bottom surface of the wedge block is an acute angle.

13. The card shoe of claim 10 wherein a portion of the roller extends a distance beyond the bottom surface of the wedge block, the distance being adjustable.

10

14. The card shoe of claim 10, further comprising:

a handle coupled to the wedge block.

15 15. The card shoe of claim 14 wherein the handle is positioned on a rear portion of the wedge block.

16. The card shoe of claim 10, further comprising:

20 a clutch assembly coupling the roller to the wedge block, wherein the clutch assembly is lockable onto the shaft when the roller is urged in the direction opposite the first rotational direction.

17. The card shoe of claim 10 wherein the opening in the housing is sized to permit extraction of one playing card at a time.

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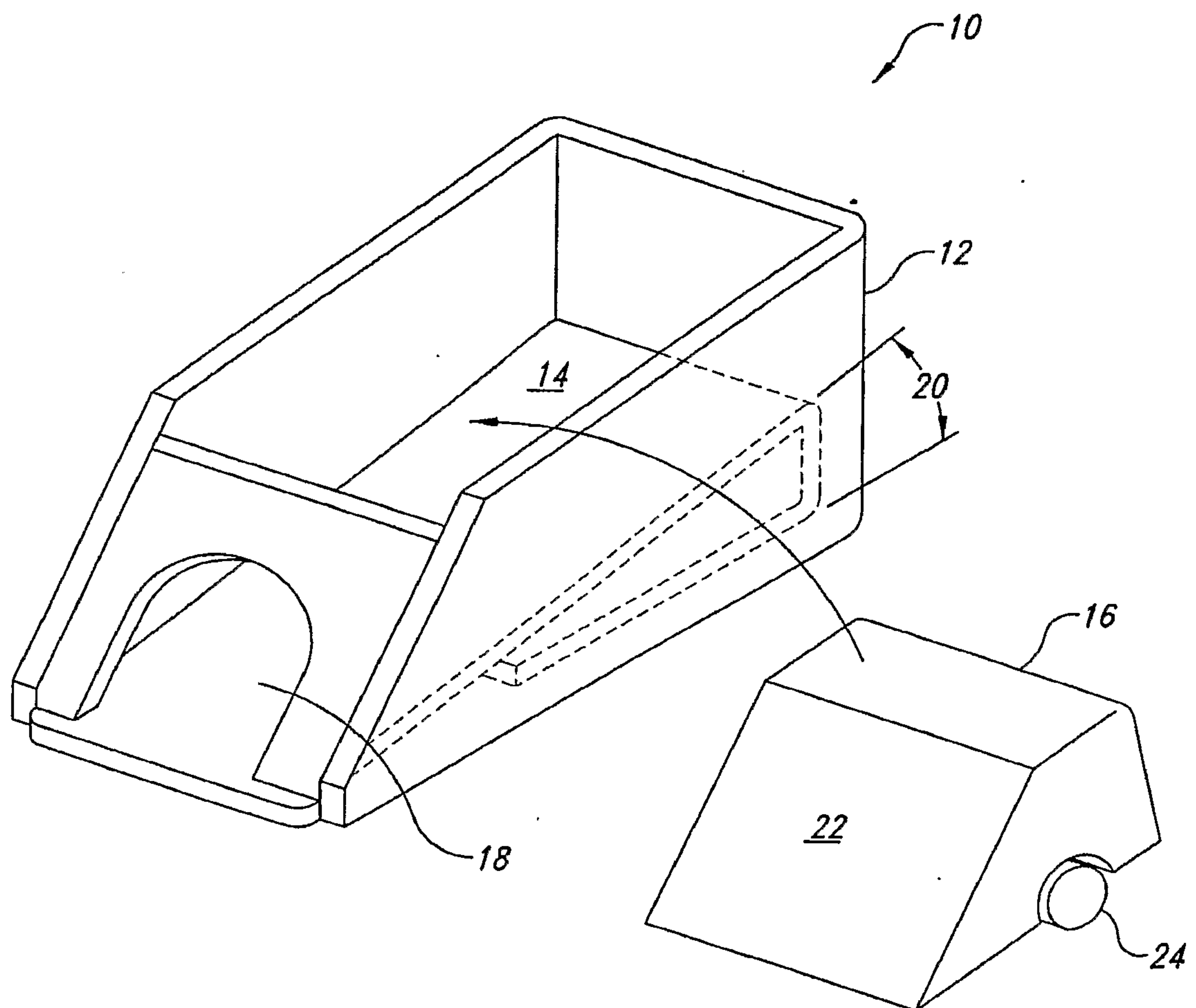


FIG. 1
(Prior Art)

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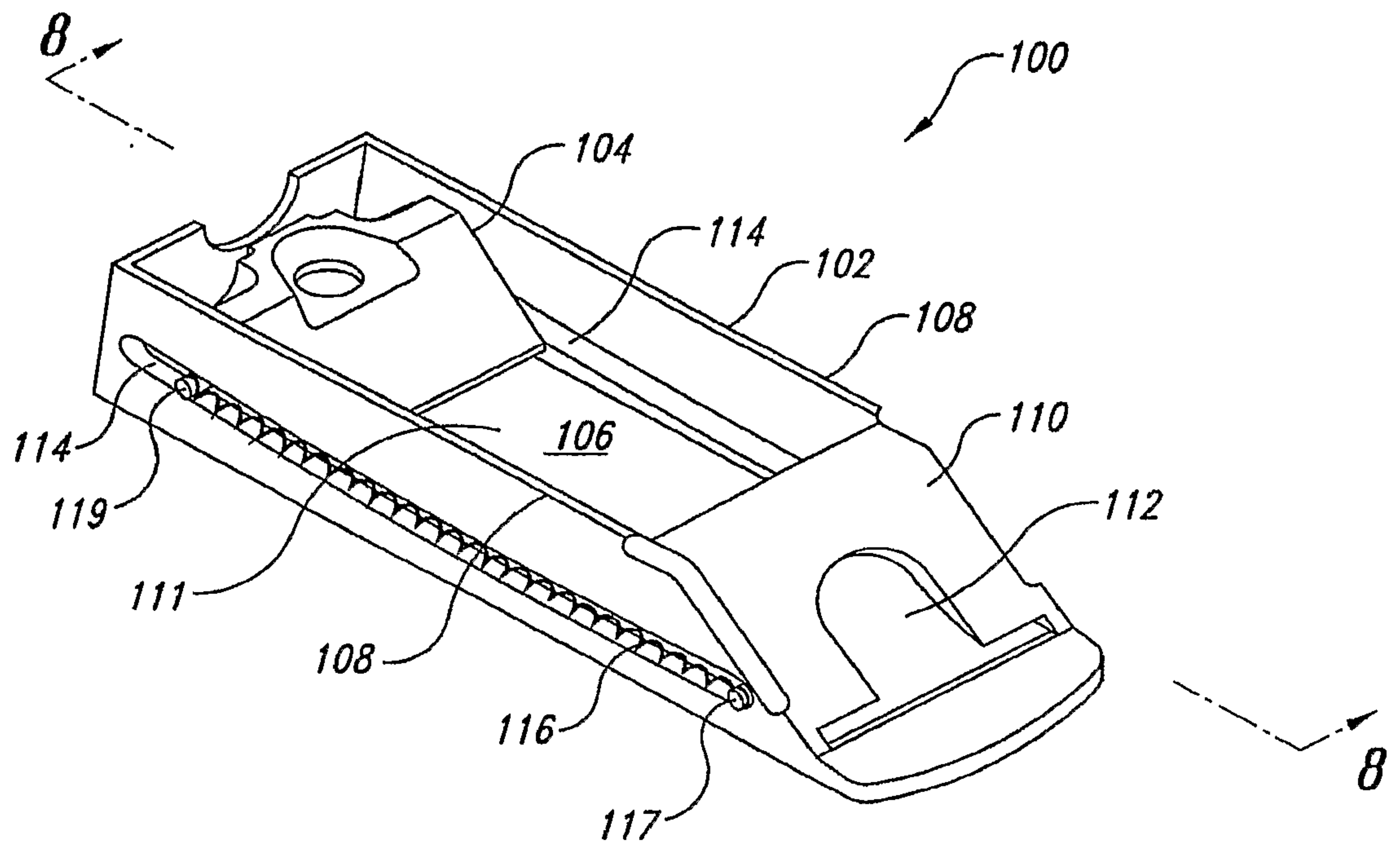


FIG. 2

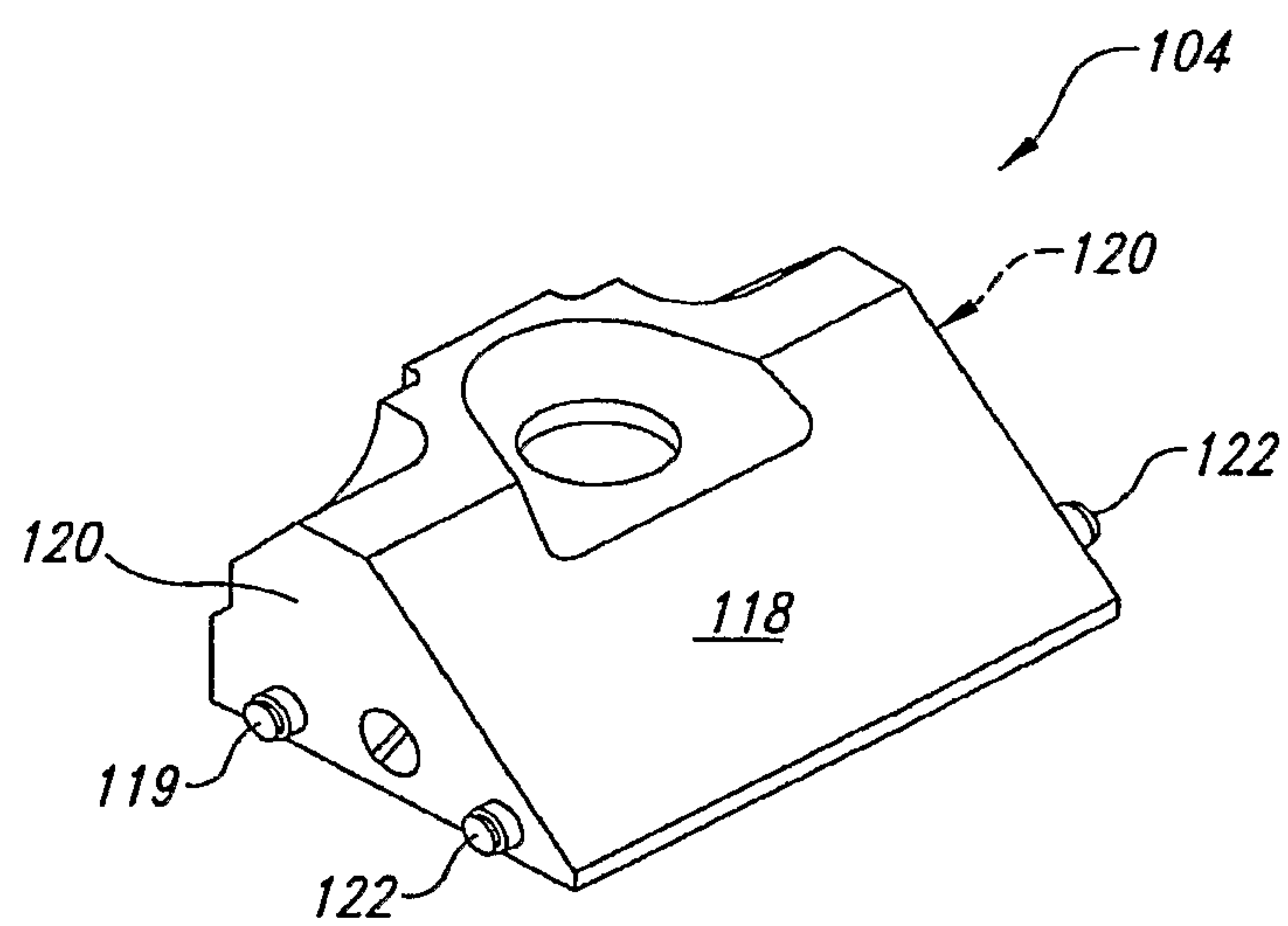


FIG. 3

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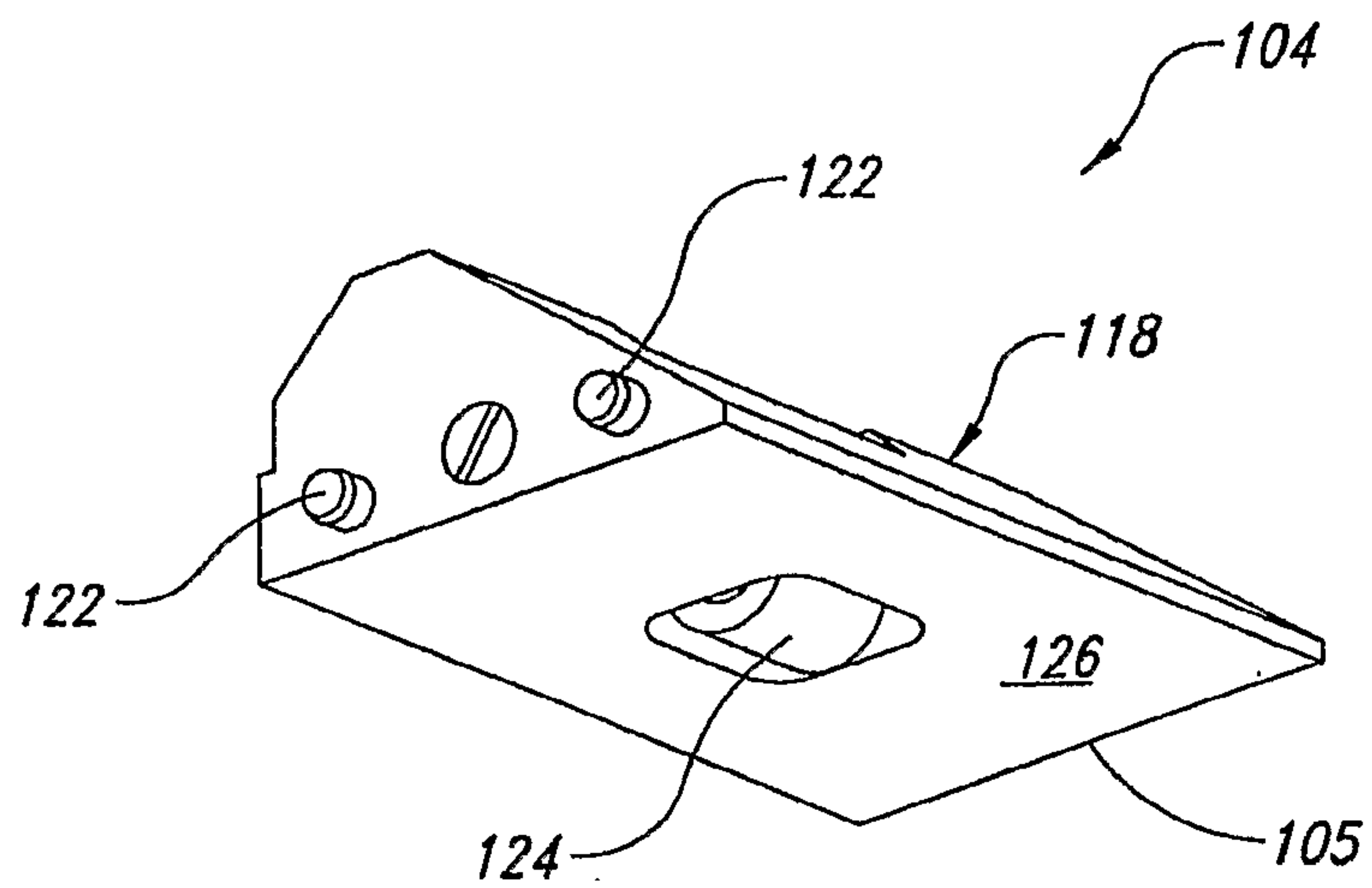


FIG. 4

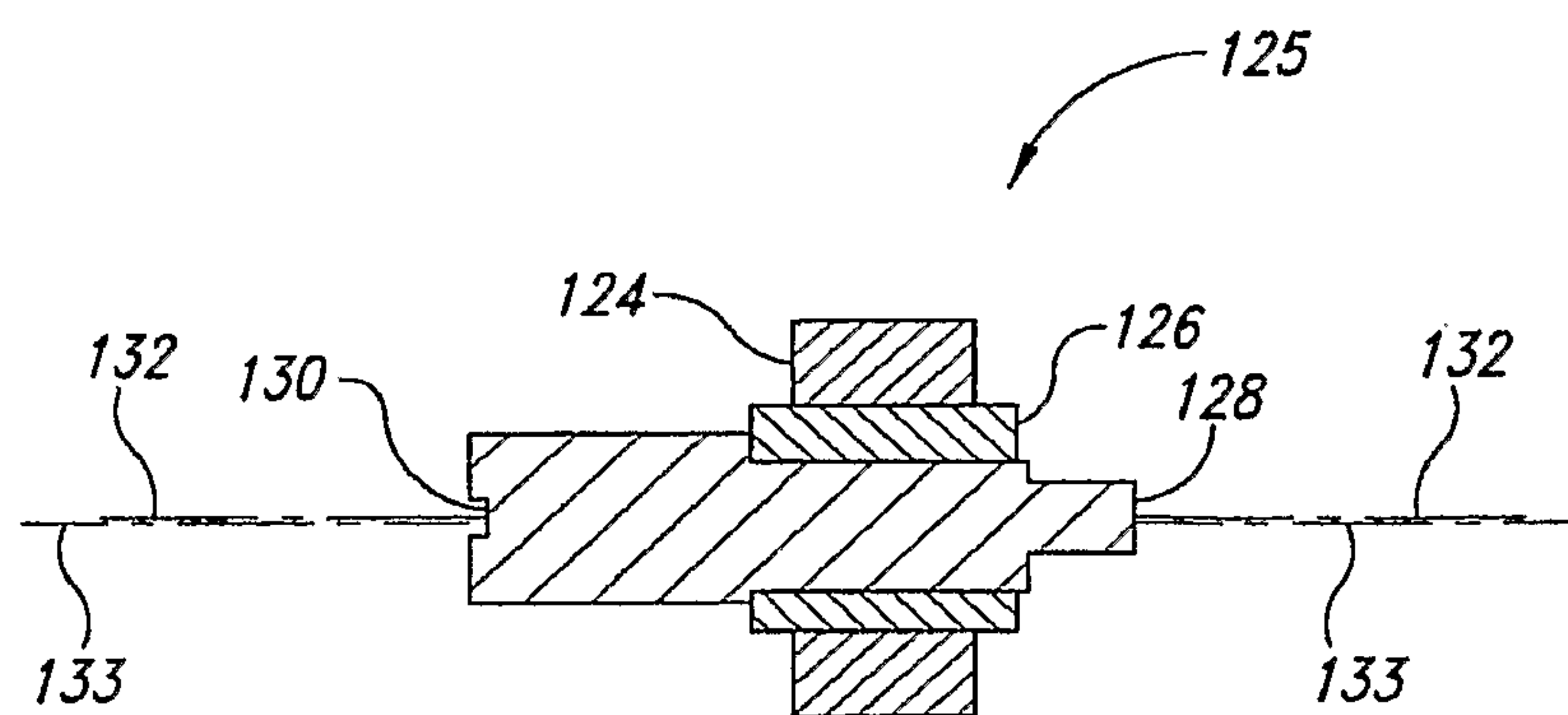


FIG. 5

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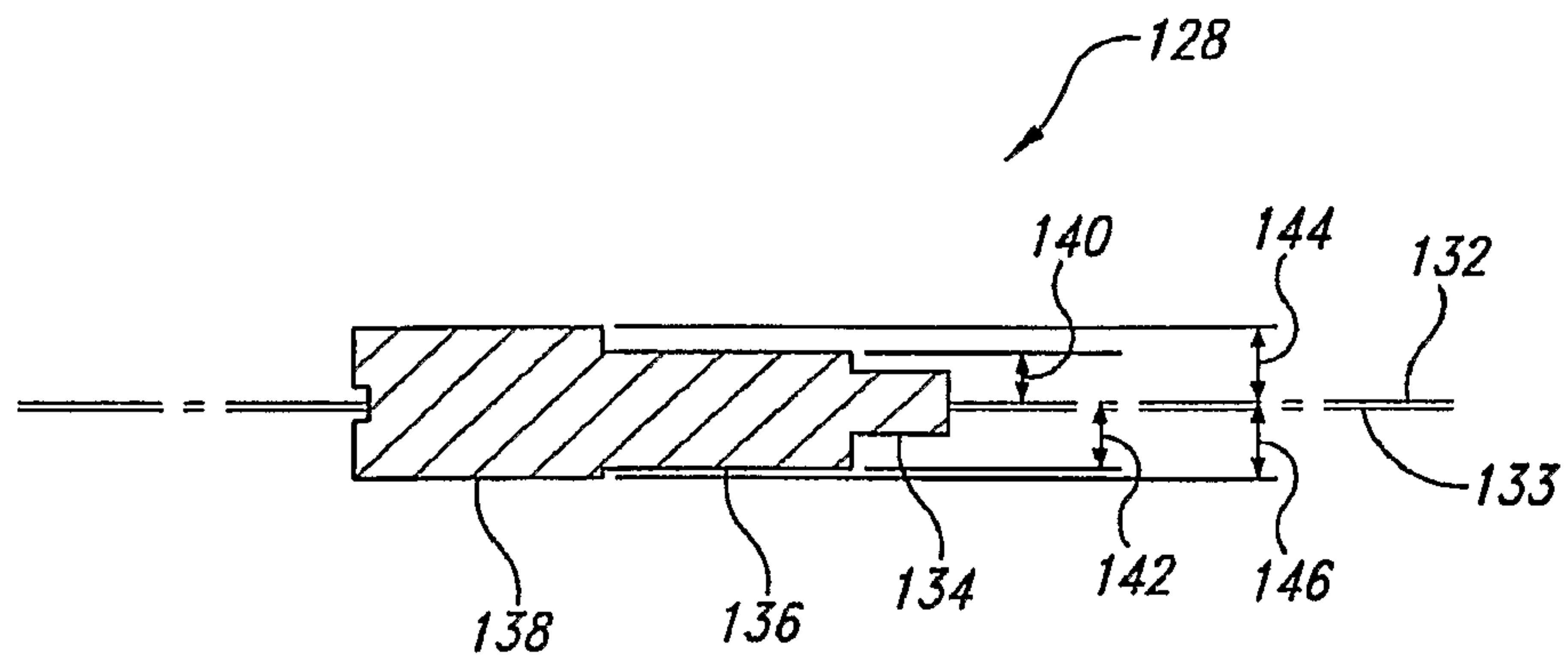


FIG. 6

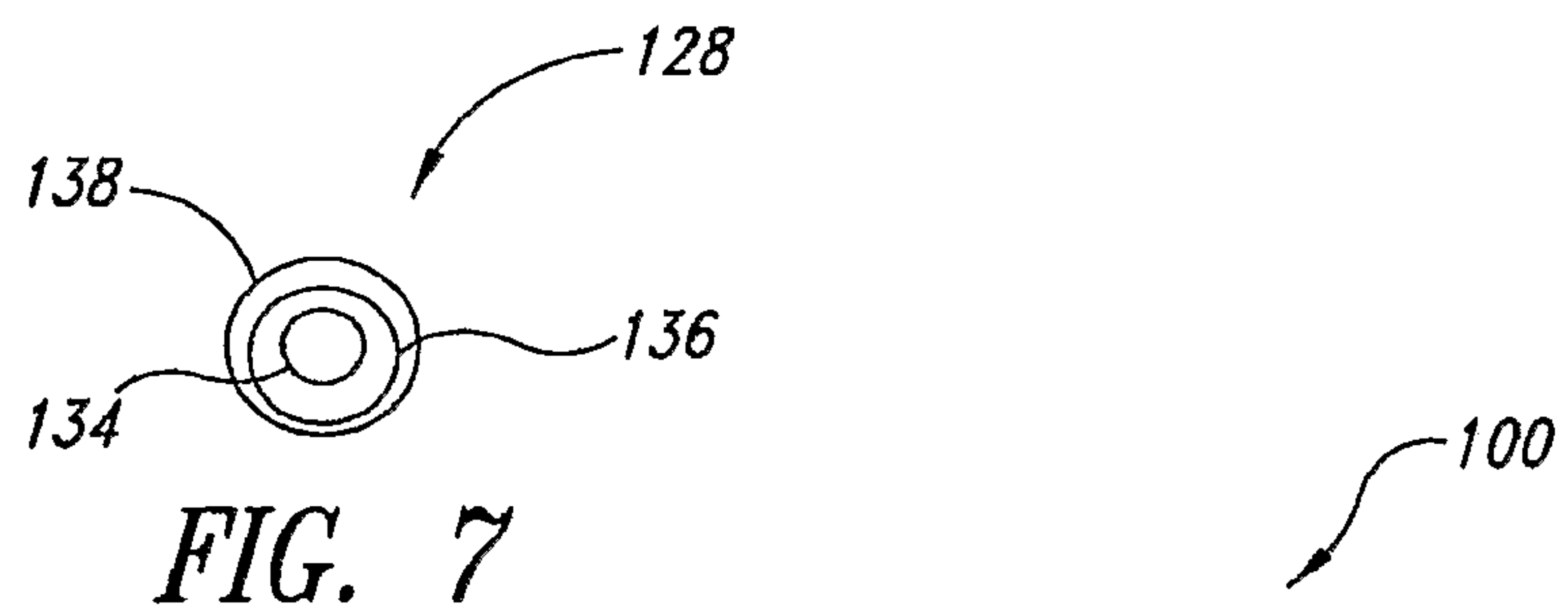


FIG. 7

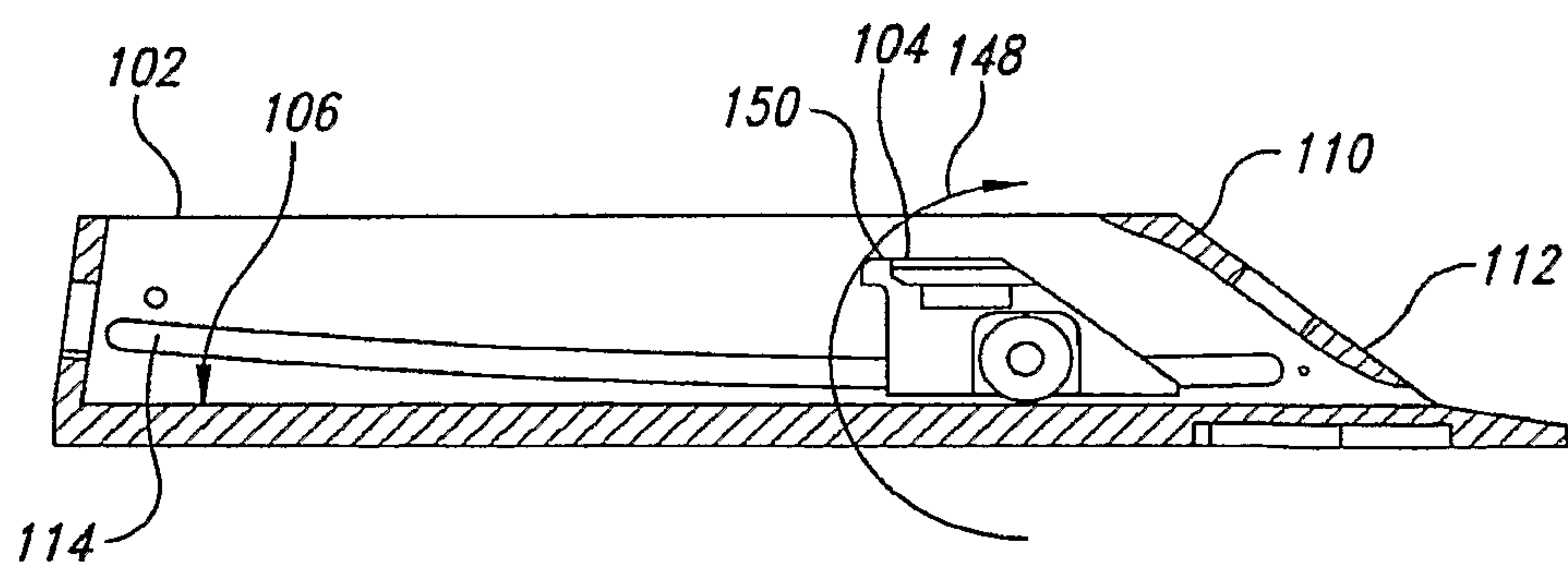


FIG. 8

