



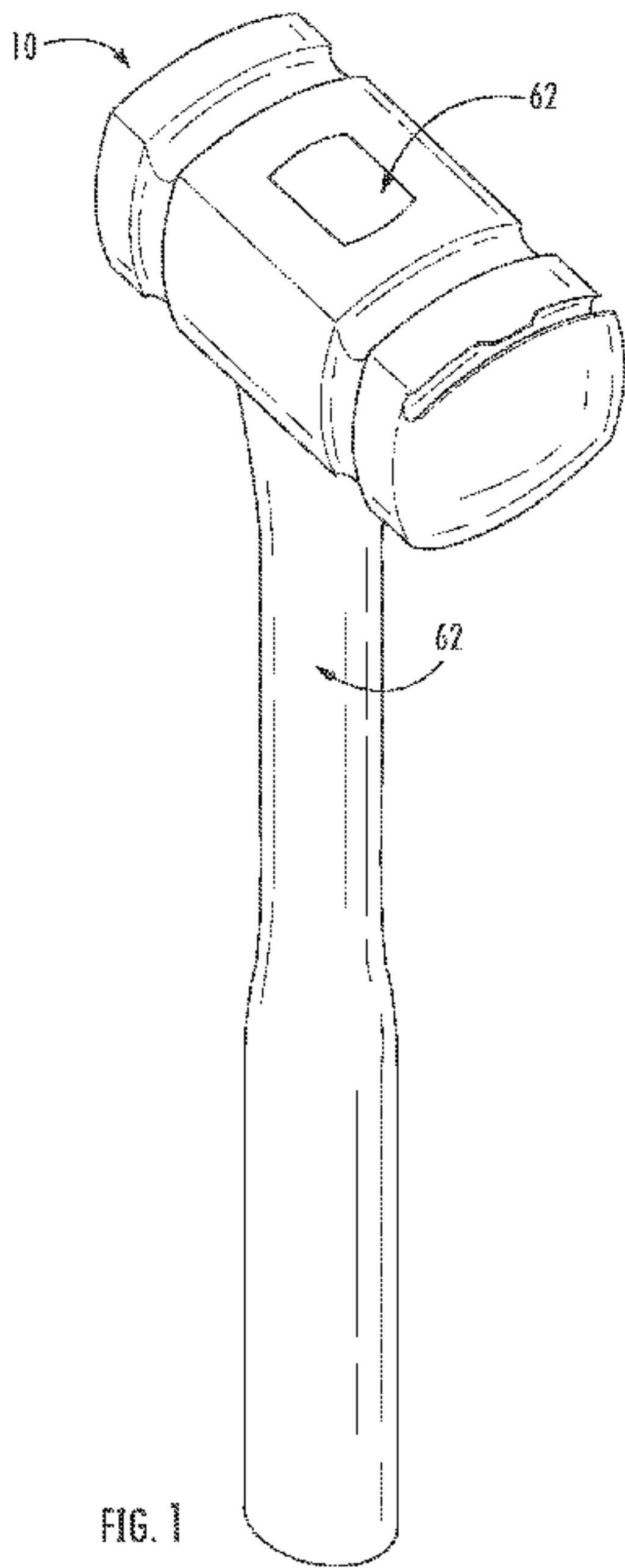
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(54) **Title:** HAMMER

(57) **Abstract:** A tool, such as a hammer, including a surface to strike objects, such as nails, and a mechanism to facilitate the removal of objects, such as staples that have been inserted into wood. In one embodiment the mechanism includes a recess in the hammerhead body and a projection that extends above the recess.



HAMMER

CROSS-REFERENCE TO RELATED PATENT APPLICATION

[0001] The present application claims the benefit of and priority to U.S. Provisional Application No. 62/959,566, filed on January 10, 2020, which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] The present disclosure relates generally to the field of tools. The present disclosure relates specifically to a hammer with a projection to facilitate interfacing with other objects, such as staples.

[0003] Hammers are used to strike objects, such as to strike a nail into a wooden board. Hammers commonly include a device to interface with other components, such as a device to remove nails.

SUMMARY OF THE INVENTION

[0004] One embodiment of the invention relates to a hammer, staple-puller combination tool including a handle including a gripping portion, a body rigidly coupled to the handle, a striking surface at a first end of the body, a rear surface at a second end of the body opposite the first end, an upper surface of the body facing away from the gripping portion, a recess between the upper surface and the rear surface, and a projection. The projection extends from the upper surface towards the rear surface above the recess. The projection has a width dimension and a length dimension and the recess has a length dimension and a depth dimension. The width and the length dimensions of the projection and the length and depth dimensions of the recess are configured to engage a staple.

[0005] Another embodiment of the invention relates to a hammer, staple-puller combination tool including a handle including a gripping portion, a body rigidly coupled to the body, a striking surface at a first end of the body, a rear surface at a second end of the body opposite the first end, an upper surface facing away from the gripping portion, and a projection. The projection extends from the upper surface to an end of the projection. The projection extends a

first distance away from the striking surface and the rear surface is a second distance from the striking surface further than the first distance.

[0006] Another embodiment of the invention relates to a hammer, staple-puller combination tool including a handle including a gripping portion, a body rigidly coupled to the body, a striking surface at a first end of the body, a rear surface at a second end of the body opposite the first end, an upper surface facing away from the gripping portion, a recess between the upper surface and the rear surface, and a projection extending from the upper surface towards the rear surface. The recess extends inwardly into the body with respect to both the upper surface and the rear surface.

[0007] Another embodiment of the invention relates to a handheld tool, such as a hammer, including a handle, and a hammerhead body rigidly coupled to the handle. The hammerhead body includes a striking surface at a first end of the hammerhead body, a recess partially defined by an internal surface that extends from a first edge of the hammerhead body to a second edge of the hammerhead body, and a projection that extends from the first edge over the recess.

[0008] In a specific embodiment, the first edge is the transition from a top surface of the hammerhead body to the internal surface of the recess, and the second edge is the transition from a back surface of the hammerhead body at a second end of the hammerhead body opposite the first end. In another specific embodiment,

[0009] Another embodiment of the invention relates to a handheld tool, such as a hammer, including a handle and a hammerhead body rigidly coupled to the body. The hammerhead body defines a striking surface and a back surface opposite the striking surface. The hammerhead body includes a projection that does not extend past the back surface. In a specific embodiment the projection extends from a first corner of the hammerhead body, the first corner defining the transition from a back surface of the hammerhead body to a top surface of the hammerhead body.

[0010] Additional features and advantages will be set forth in the detailed description which follows, and, in part, will be readily apparent to those skilled in the art from the description or recognized by practicing the embodiments as described in the written description and claims hereof, as well as the appended drawings. It is to be understood that both the foregoing general description and the following detailed description are exemplary.

[0011] The accompanying drawings are included to provide further understanding and are incorporated in and constitute a part of this specification. The drawings illustrate one or more

embodiments and, together with the description, serve to explain principles and operation of the various embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0012] FIG. 1 is a perspective view of a hammer, according to an embodiment.
- [0013] FIG. 2 is a perspective view of the hammer of FIG. 1, according to an embodiment.
- [0014] FIG. 3 is a side view of the hammer of FIG. 1, according to an embodiment.
- [0015] FIG. 4 is a detailed side view of the hammer of FIG. 1, according to an embodiment.
- [0016] FIG. 5 is a perspective view of the hammer of FIG. 1, according to an embodiment.
- [0017] FIG. 6 is a detailed perspective view of the hammer of FIG. 1, according to an embodiment.
- [0018] FIG. 7 is a side view of the hammer of FIG. 1, according to an embodiment.
- [0019] FIG. 8 is a perspective view of a projection on a hammer, according to an embodiment.

DETAILED DESCRIPTION

[0020] Referring generally to the figures, various embodiments of a hammer and elements thereof are shown. Various embodiments of the hammer discussed herein include an innovative mechanism for the hammer to interface with other objects.

[0021] As will be generally understood, a hammer includes a head with a striking surface. Described herein is one or more embodiments of a hammer in which the head also includes a mechanism to facilitate the removal of staples, such as construction staples, that have been applied to objects such as wood, shingles, etc. Combining the functionality of a striking surface with the ability to remove staples in a single tool reduces the number of tools a worker needs to carry and/or interact with, thereby increasing the efficiency of the worker.

[0022] Referring to Figs. 1-2, a device for striking objects, such as hammer 10, is shown according to an exemplary embodiment. In a specific embodiment, hammer 10 is a hammer, staple-puller combination tool. In this exemplary embodiment hammer 10 includes a handle, a shaft or body 62 and hammerhead body 20. In one use, the handle includes a gripping portion that is gripped by a user and rotated so that hammerhead body 20 strikes a desired object. In various embodiments the handle is rubber, fiberglass, wood, plastic, steel, titanium and/or aluminum. Shaft or body 62 is rigidly coupled to hammerhead body 20.

[0023] Hammerhead body 20 defines striking surface 22 at first end 24 of hammerhead body 20. Hammerhead body 20 also defines an upper or top surface 40, bottom surface 60, lateral surface 58, and a rear or back surface 42. Back surface 42 is at second end 26 of hammerhead body, opposite first end 24. In a specific embodiment, one or more of top surface 40 and bottom surface 60 are planar. In a specific embodiment, top surface 40 faces away from the gripping portion of shaft or body 62.

[0024] In a specific embodiment, as shown, recess 28 is defined by internal surface 30, which extends from first edge 32 to second edge 34. Recess 28 is between top surface 40 and back surface 42. Top surface 40 and internal surface 30 each extend from first edge 32, and back surface 42 and internal surface 30 each extend from second edge 34. Projection 36 extends from first edge 32 and top surface 40 towards back surface 42 above recess 28. In one embodiment, recess 28 is cylindrically shaped. In one embodiment, hammerhead body 20 includes channel 80 and channel 82, which circumferentially surround hammerhead body.

[0025] In use, projection 36 can be utilized to remove a staple that has been inserted into wood. First a user forcibly pushes projection 36 between the staple and the wood. The user then pivots hammerhead body 20 in direction 64 around axis. As hammerhead body 20 pivots, projection 36 pulls the staple out of the wood until it is entirely and/or at least partially removed from the wood. It will be recognized that the rotation of hammerhead body 20 is not restricted to rotating in direction 64 around axis, and that direction 64 around axis are identified for exemplary purposes only and are not intended to be limiting of how hammer 10 may be used.

[0026] In an alternate embodiment, hammerhead body 20 does not define a recess 28 that projection 36 extends over. Instead, projection 36 extends past back surface 42 of hammerhead body 20.

[0027] Turning to FIG. 3, projection 36 extends away from striking surface 22 a length 56 from first edge 32. First edge 32 is between top surface 40 of body 20 and recess 28. In a specific embodiment, projection 36 extends above recess 28. Projection 36 comprises top surface 46 and bottom surface 48. Top surface 46 and bottom surface 48 of projection 36 collectively define angle 44 of projection 36.

[0028] In one embodiment length 56 is between 3 mm and 15 mm, and more specifically is between 5 mm and 8 mm, and even more specifically is 6 mm. In one embodiment angle 44 is

between 7 degrees and 25 degrees, and more specifically is between 9 degrees and 15 degrees, and even more specifically is 11 degrees.

[0029] In a specific embodiment, projection 36 extends a first distance 96 away from the striking surface 22 and the back surface 42 is a second distance 94 from the striking surface 22 further than the first distance 96 (FIG. 3).

[0030] Turning to FIGS. 4-6, in one embodiment projection 36 includes leading edge 38, which is the furthest portion of projection 36 from striking surface 22. Leading edge 38 defines a width 54.

[0031] Recess 28 comprises upper surface 72 that extends from top surface 40 of body 20, lower surface 74 that extends from the back surface 42 of body 20, and rounded end surface 76 that extends between upper surface 72 of recess 28 and lower surface 74 of recess 28. Upper surface 72 of recess 28 extends away from top surface 40 of body 20 at angle 84. Lower surface 74 of recess 28 extends away from back surface 42 of body 20 (e.g., from a plane generally parallel to back surface) at angle 88.

[0032] Lower surface 74 extends away from rounded end surface 76 towards back surface 42 at angle 86 relative to horizontal plane 78. In a specific embodiment, horizontal plane 78 is generally parallel to top surface 40 and bottom surface 60 of body 20. In a specific embodiment, horizontal plane 78 is perpendicular to shaft or body 62.

[0033] In one embodiment angle 84 is between 50 degrees and 80 degrees, and more specifically is between 60 degrees and 70 degrees. In one embodiment angle 86 is between 30 degrees and 55 degrees, and more specifically is between 35 degrees and 50 degrees. In one embodiment angle 88 is between 70 degrees and 110 degrees, and more specifically is between 80 degrees and 100 degrees.

[0034] Recess 28 extends inwardly into body 20 with respect to both top surface 40 and back surface 42. Recess 28 extends length 90 in a rearward direction from back surface 42, measured from the transition between upper surface 72 and rounded end surface 76 to the transition between lower surface 74 and back surface 42. Recess extends depth 92 in a downward direction from top surface 40.

[0035] In one embodiment width 54 is between 3 mm and 12 mm, and more specifically is between 5 mm and 10 mm, and even more specifically is 8 mm. In one embodiment, projection 36 extends away from top surface 40 of body 20 at angle 68 and angle 70. In one embodiment,

angle 68 and angle 70 are between 25 degrees and 65 degrees, and more specifically are between 35 degrees and 55 degrees, and even more specifically are 45 degrees.

[0036] In a specific embodiment, projection 36 has a width 54 dimension (FIG. 6) and a length 56 dimension (FIG. 4) and recess 28 has a length 90 dimension (FIG. 4) and a depth 92 dimension (FIG. 4), wherein the width 54 and the length 56 dimensions of the projection 36 and the length 90 and depth 92 dimensions of the recess 28 are configured to engage a staple.

[0037] Referring to FIG. 8, an exemplary embodiment of hammer 110 comprising body 120 and projection 136 are shown. Hammer 110 and projection 136 are substantially the same as hammer 10 and projection 36, respectively, except for the differences depicted and discussed herein. Projection 136 extends from first edge 132. Projection 136 extends to leading edge 138, which in this instance is concave shaped.

[0038] It should be understood that the figures illustrate the exemplary embodiments in detail, and it should be understood that the present application is not limited to the details or methodology set forth in the description or illustrated in the figures. It should also be understood that the terminology is for description purposes only and should not be regarded as limiting.

[0039] Further modifications and alternative embodiments of various aspects of the invention will be apparent to those skilled in the art in view of this description. Accordingly, this description is to be construed as illustrative only. The construction and arrangements, shown in the various exemplary embodiments, are illustrative only. Although only a few embodiments have been described in detail in this disclosure, many modifications are possible (e.g., variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters, mounting arrangements, use of materials, colors, orientations, etc.) without materially departing from the novel teachings and advantages of the subject matter described herein. Some elements shown as integrally formed may be constructed of multiple parts or elements, the position of elements may be reversed or otherwise varied, and the nature or number of discrete elements or positions may be altered or varied. The order or sequence of any process, logical algorithm, or method steps may be varied or re-sequenced according to alternative embodiments. Other substitutions, modifications, changes and omissions may also be made in the design, operating conditions and arrangement of the various exemplary embodiments without departing from the scope of the present invention.

[0040] Unless otherwise expressly stated, it is in no way intended that any method set forth herein be construed as requiring that its steps be performed in a specific order. Accordingly, where a method claim does not actually recite an order to be followed by its steps or it is not otherwise specifically stated in the claims or descriptions that the steps are to be limited to a specific order, it is in no way intended that any particular order be inferred. In addition, as used herein, the article "a" is intended to include one or more component or element, and is not intended to be construed as meaning only one. As used herein, "rigidly coupled" refers to two components being coupled in a manner such that the components move together in a fixed positional relationship when acted upon by a force.

[0041] Various embodiments of the invention relate to any combination of any of the features, and any such combination of features may be claimed in this or future applications. Any of the features, elements or components of any of the exemplary embodiments discussed above may be utilized alone or in combination with any of the features, elements or components of any of the other embodiments discussed above.

CLAIMS

What is claimed is:

1. A hammer, staple-puller combination tool comprising:
 - a handle including a gripping portion;
 - a body rigidly coupled to the handle;
 - a striking surface at a first end of the body;
 - a rear surface at a second end of the body opposite the first end;
 - an upper surface of the body facing away from the gripping portion;
 - a recess between the upper surface and the rear surface; and
 - a projection extending from the upper surface towards the rear surface above the recess,the projection having a width dimension and a length dimension and the recess having a length dimension and a depth dimension, wherein the width and the length dimensions of the projection and the length and depth dimensions of the recess are configured to engage a staple.
2. The hammer, staple-puller combination tool of claim 1, the recess comprising an upper surface that extends from the upper surface of the body, a lower surface that extends from the rear surface of the body, and a curved end surface that extends between the upper surface of the recess and the lower surface of the recess.
3. The hammer, staple-puller combination tool of claim 2, wherein the upper surface of the recess extends away from the upper surface of the body at an angle between 50 degrees and 80 degrees.
4. The hammer, staple-puller combination tool of claim 2, wherein the lower surface of the recess extends away from the rear surface of the body at an angle between 70 degrees and 110 degrees.
5. The hammer, staple-puller combination tool of claim 1, wherein the projection extends a first distance away from the striking surface, and wherein the rear surface is a second distance from the striking surface further than the first distance.

6. The hammer, staple-puller combination tool of claim 1, wherein the projection extends a length away from an edge between the upper surface of the body and the recess, and wherein the length is between 3 mm and 15 mm.
7. The hammer, staple-puller combination tool of claim 1, the projection comprises a top surface and a bottom surface that define an angle between 7 degrees and 25 degrees.
8. The hammer, staple-puller combination tool of claim 1, wherein the projection extends at an angle from an edge between the upper surface of the body and the recess, wherein the angle is between 25 degrees and 65 degrees.
9. A hammer, staple-puller combination tool comprising:
 - a handle including a gripping portion;
 - a body rigidly coupled to the body;
 - a striking surface at a first end of the body;
 - a rear surface at a second end of the body opposite the first end;
 - an upper surface facing away from the gripping portion; and
 - a projection extending from the upper surface to an end of the projection, wherein the projection extends a first distance away from the striking surface and the rear surface is a second distance from the striking surface further than the first distance.
10. The hammer, staple-puller combination tool of claim 9, wherein the projection extends a length away from an edge between the upper surface of the body and a recess defined by the body, and wherein the length is between 5 mm and 8 mm.
11. The hammer, staple-puller combination tool of claim 1, wherein the projection comprises a top surface and a bottom surface that define an angle between 9 degrees and 15 degrees.
12. The hammer, staple-puller combination tool of claim 9, the projection comprises an end furthest from the striking surface, wherein the end of the projection extends a length from an

edge between the upper surface of the body and a recess defined by the body, wherein the length is between 5 mm and 8 mm.

13. The hammer, staple-puller combination tool of claim 9, the projection comprises an end, wherein the projection extends away from the upper surface of the body at an angle is between 25 degrees and 65 degrees.

14. The hammer, staple-puller combination tool of claim 9, further comprising a recess between the upper surface and the rear surface, the recess comprising an upper surface that extends away from the upper surface of the body at an angle between 60 degrees and 70 degrees.

15. A hammer, staple-puller combination tool comprising:
a handle including a gripping portion;
a body rigidly coupled to the body;
a striking surface at a first end of the body;
a rear surface at a second end of the body opposite the first end;
an upper surface facing away from the gripping portion;
a recess between the upper surface and the rear surface, the recess extending inwardly into the body with respect to both the upper surface and the rear surface; and
a projection extending from the upper surface towards the rear surface.

16. The hammer, staple-puller combination tool of claim 15, the recess comprising an upper surface that extends from the upper surface of the body, wherein the upper surface of the recess extends away from the upper surface of the body at an angle between 50 degrees and 80 degrees.

17. The hammer, staple-puller combination tool of claim 15, the recess comprising a lower surface that extends from the rear surface of the body, wherein the lower surface of the recess extends away from the rear surface of the body at an angle between 70 degrees and 110 degrees.

18. The hammer, staple-puller combination tool of claim 15, wherein the projection extends a length away from an edge between the upper surface of the body and the recess, and wherein the length is between 3 mm and 15 mm.

19. The hammer, staple-puller combination tool of claim 15, wherein the projection extends a first distance away from the striking surface, and wherein the rear surface is a second distance from the striking surface further than the first distance.

20. The hammer, staple-puller combination tool of claim 15, the projection extending above the recess.

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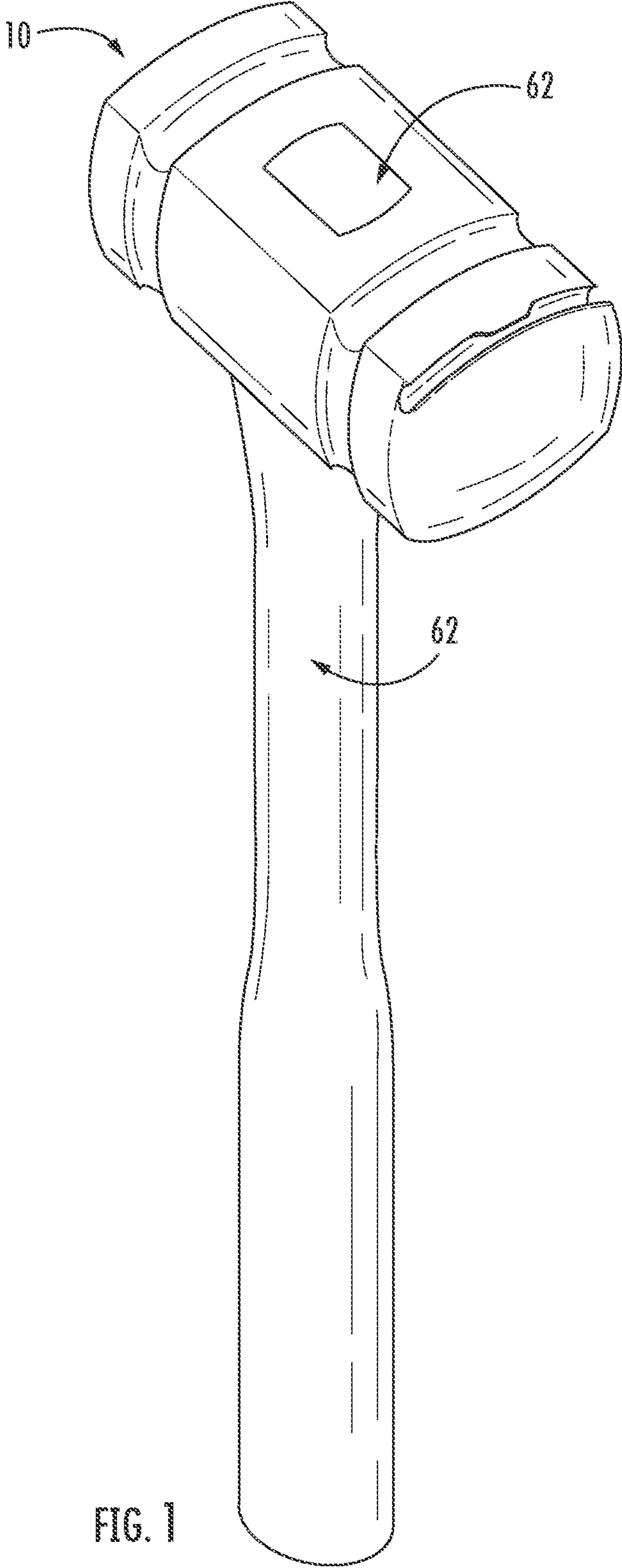


FIG. 1

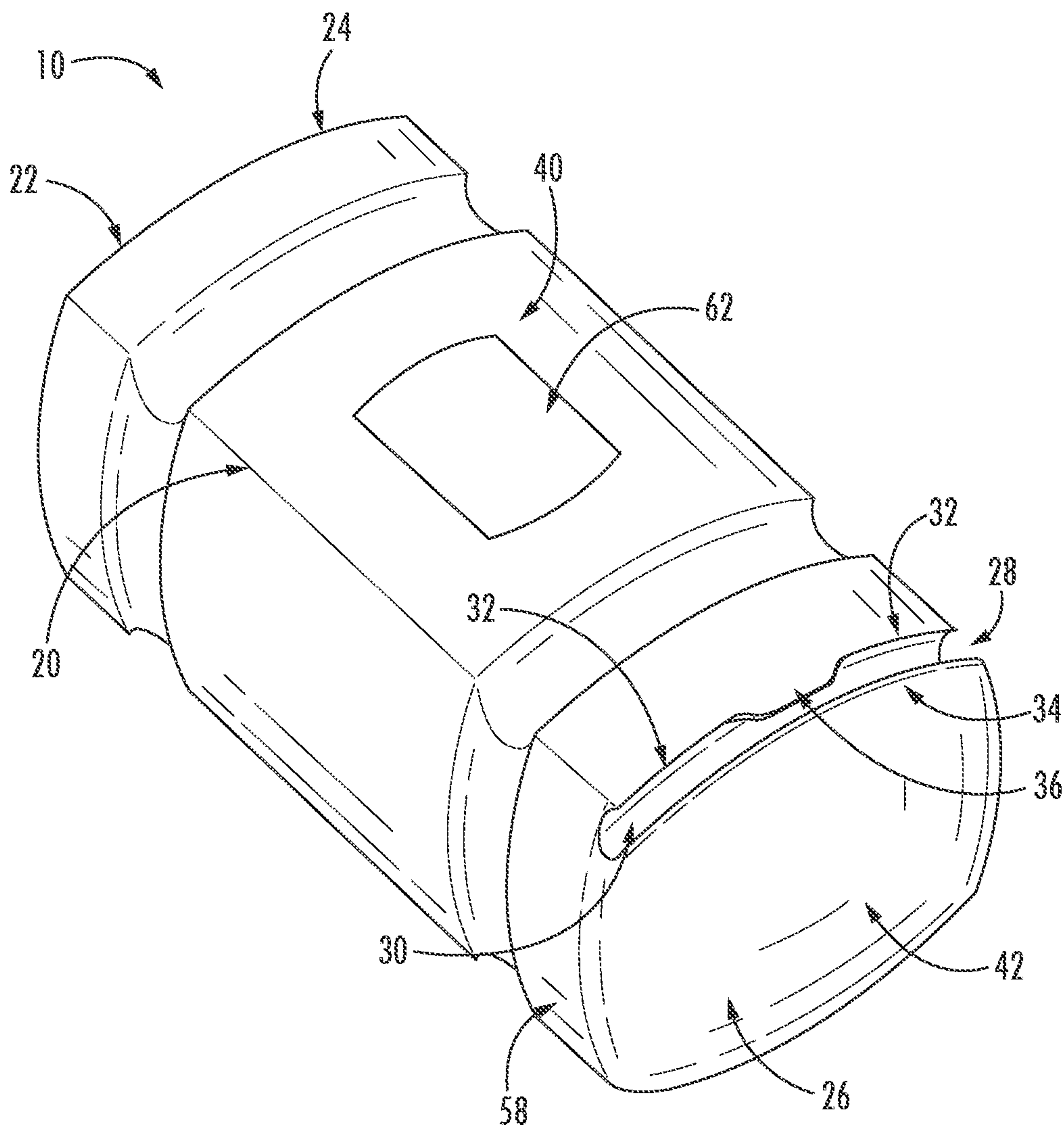


FIG. 2

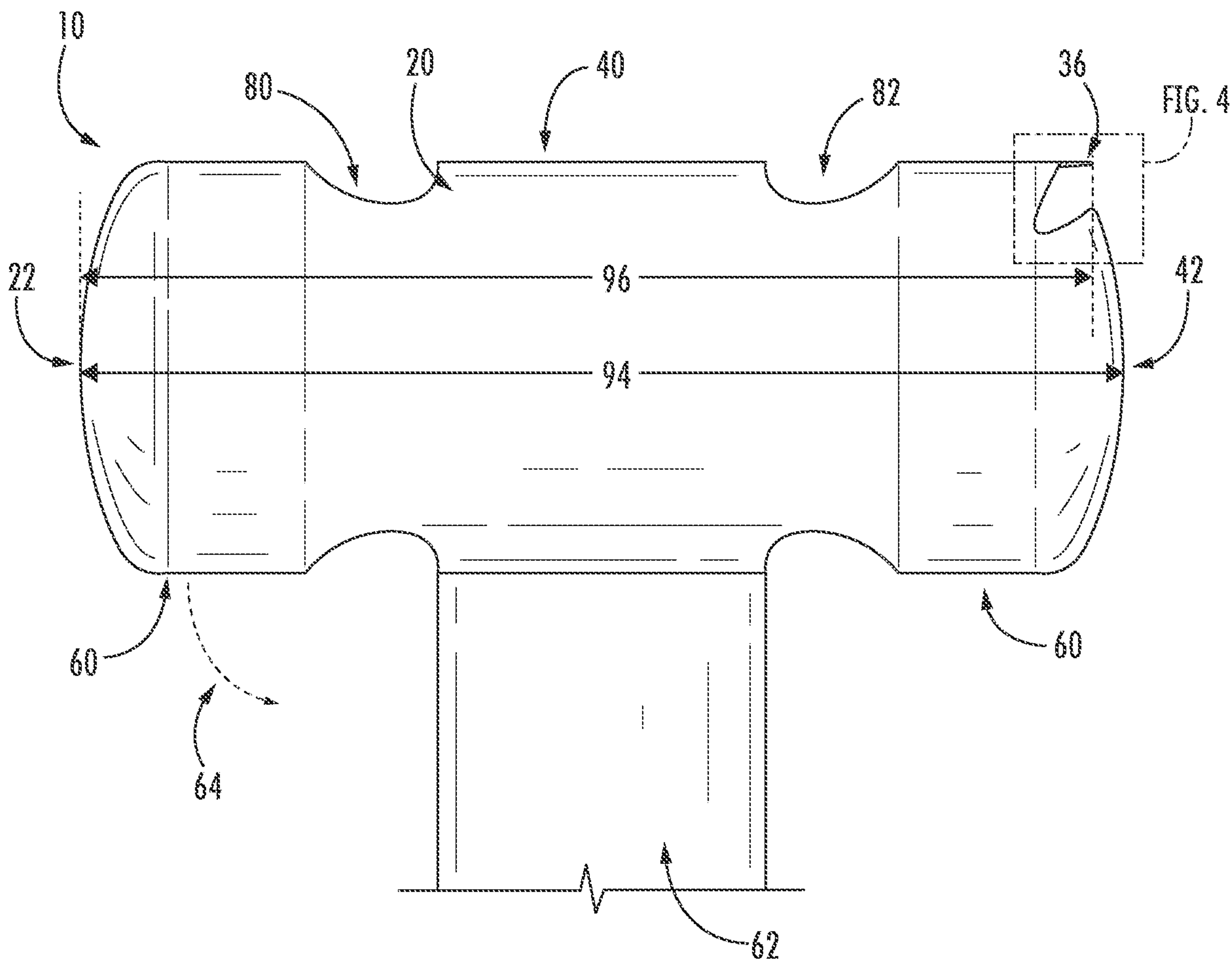


FIG. 3

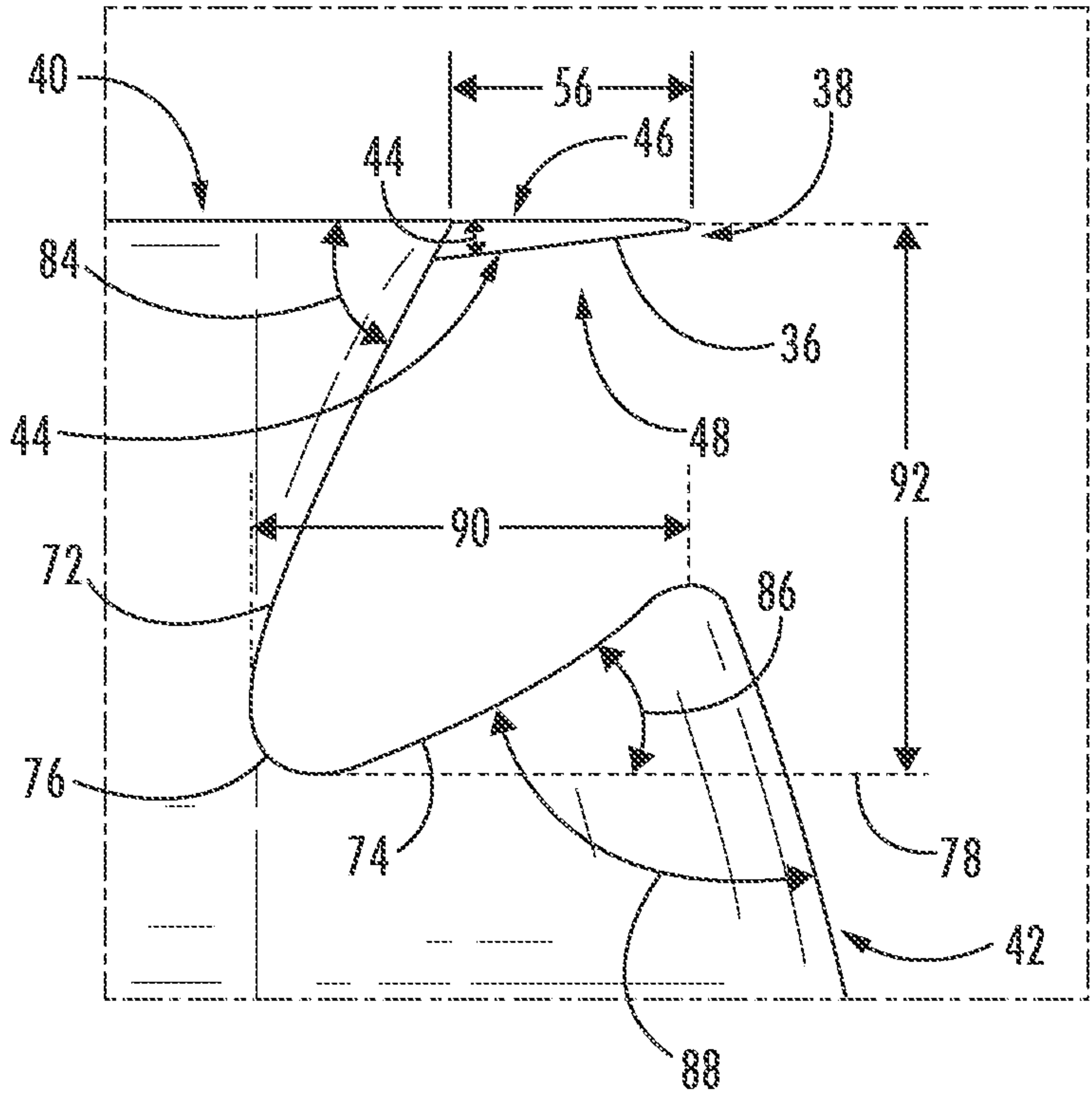


FIG. 4

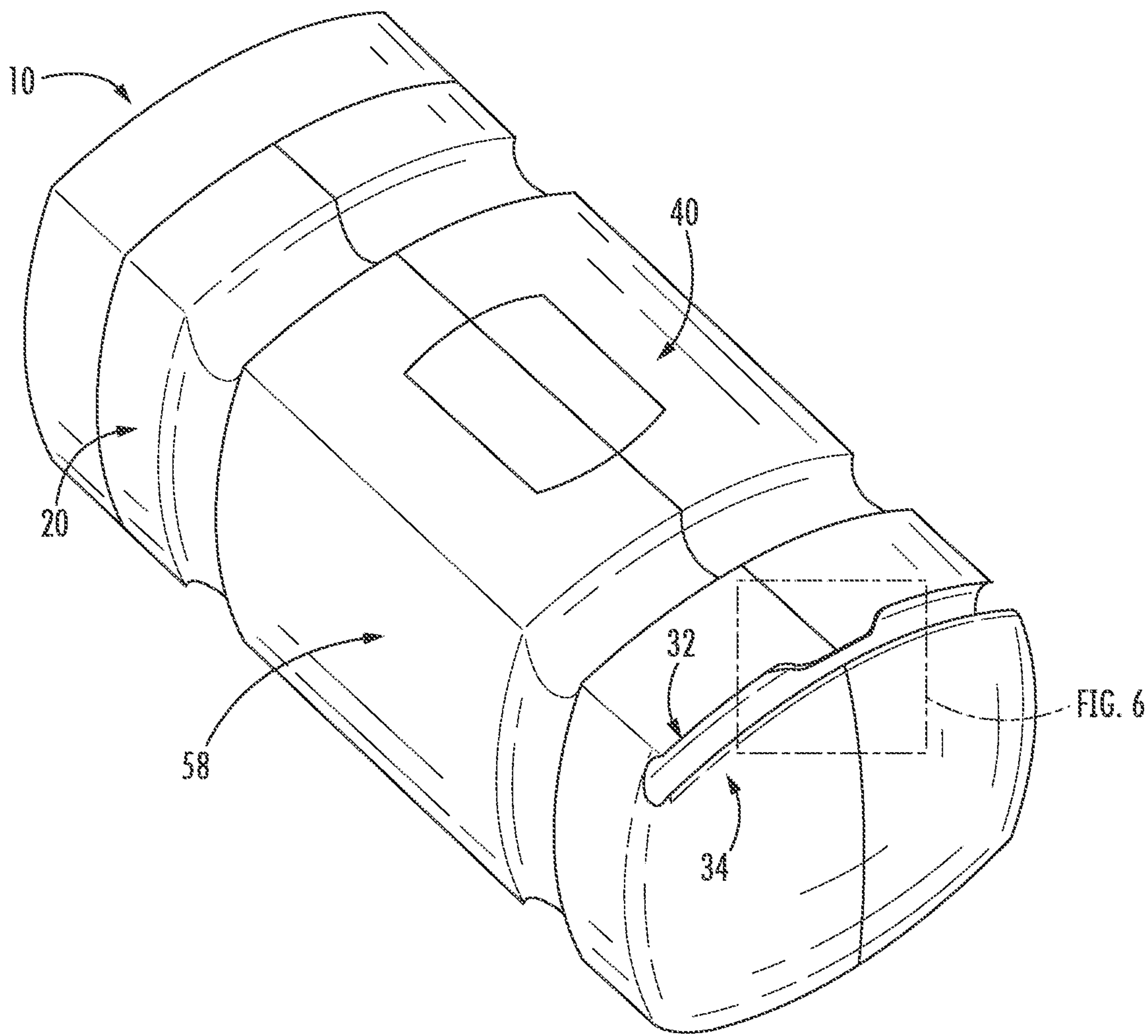


FIG. 5

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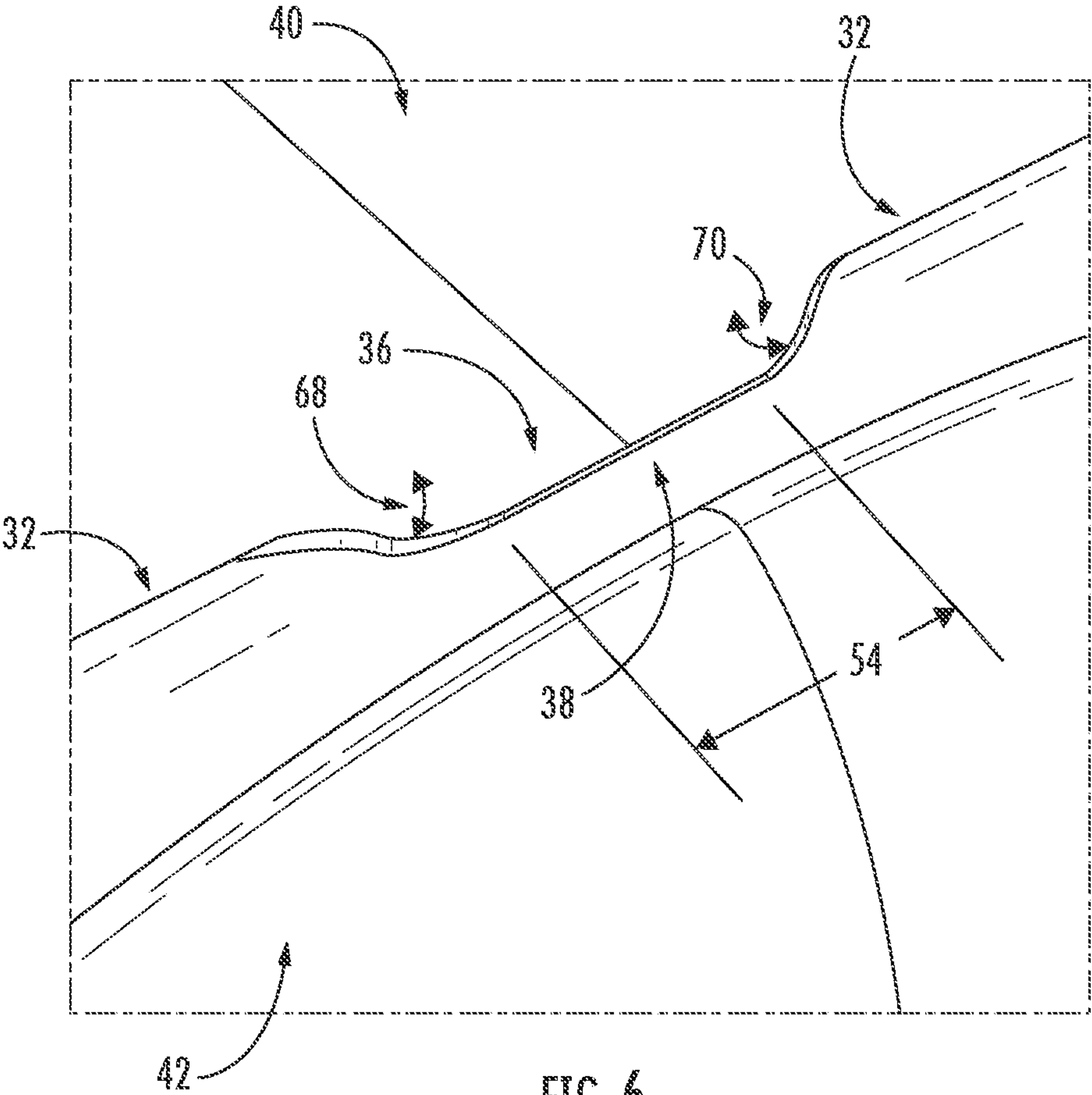


FIG. 6

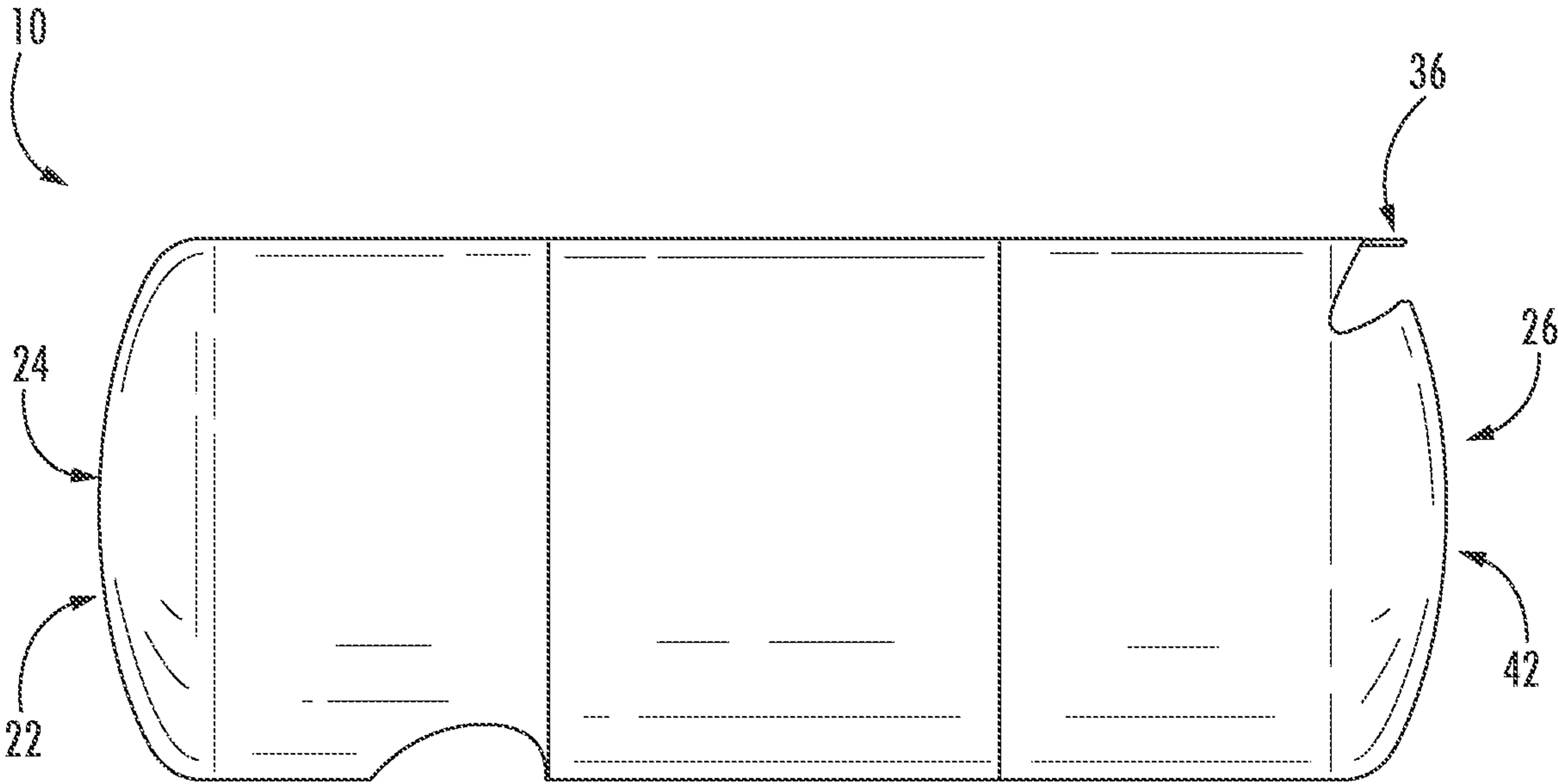


FIG. 7

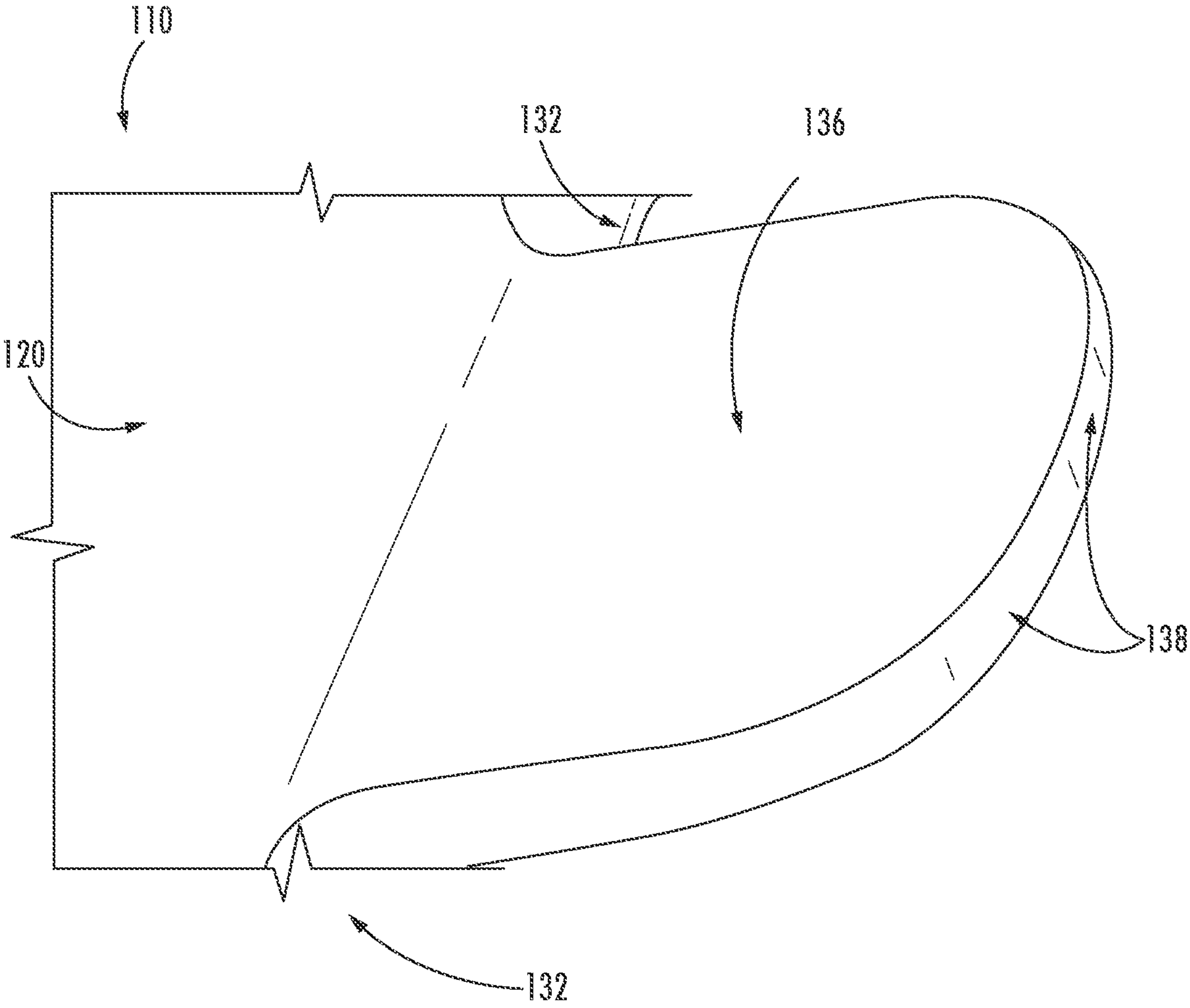


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2021/012617

A. CLASSIFICATION OF SUBJECT MATTER

B25D 1/04(2006.01)i; B25D 1/14(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B25D 1/04(2006.01); B25D 1/00(2006.01); B25F 1/00(2006.01); E04F 21/18(2006.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & keywords: hammer, staple, puller, handle, recess, projection, curved end surface

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2004-009237 A (TSUCHIYA, KEIJI) 15 January 2004 (2004-01-15) paragraphs [0010]-[0013] and figures 1-3	1-20
A	CN 108527262 A (YUNHE LUJIABAN HANDICRAFT OPERATION DEPARTMENT) 14 September 2018 (2018-09-14) paragraph [0023] and figure 1	1-20
A	US 6829966 B1 (BRAMUCHI, ROBERT M.) 14 December 2004 (2004-12-14) figure 1	1-20
A	CN 201208742 Y (MCC JINGTANG CONSTRUCTION CO., LTD.) 18 March 2009 (2009-03-18) figures 1-2	1-20
A	US 2015-0231776 A1 (DOSTER, JR., JOHN E.) 20 August 2015 (2015-08-20) paragraphs [0023]-[0027] and figures 1-9	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

23 April 2021

Date of mailing of the international search report

23 April 2021

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2021/012617

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
JP	2004-009237	A	15 January 2004	JP	4198395	B2	17 December 2008
CN	108527262	A	14 September 2018	None			
US	6829966	B1	14 December 2004	None			
CN	201208742	Y	18 March 2009	None			
US	2015-0231776	A1	20 August 2015	US	9656379	B2	23 May 2017