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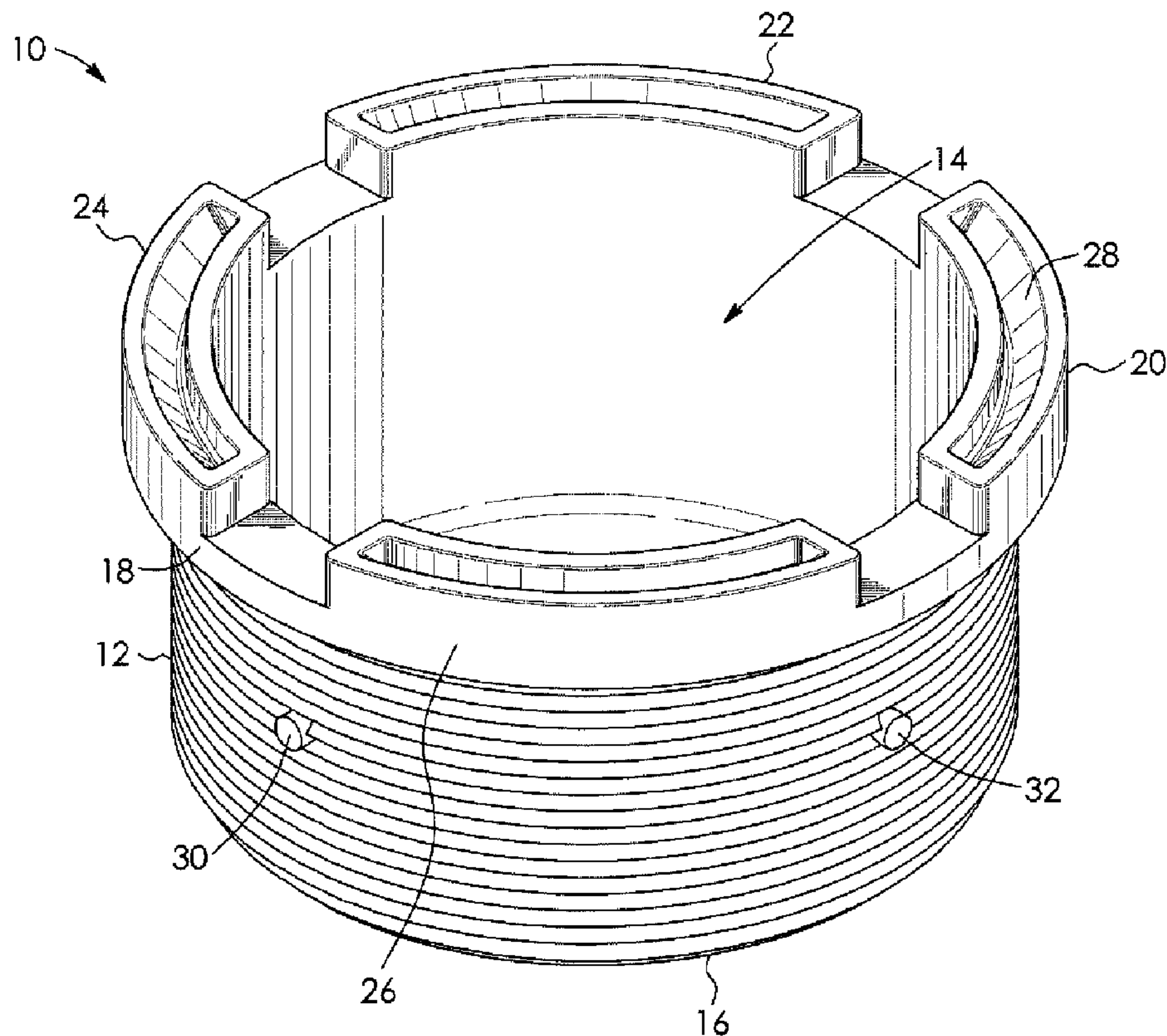
(71) **Demandeurs/Applicants:**
DANNEFFEL, MAX, CA;
DANNEFFEL, JOHN, CA

(72) **Inventeurs/Inventors:**
DANNEFFEL, MAX, CA;
DANNEFFEL, JOHN, CA

(74) **Agent:** CAMERON IP

(54) **Titre : PROTECTEUR DE FILETAGE DE TUYAU A DETENTE**

(54) **Title: PIPE THREAD PROTECTOR WITH A DETENT**



(57) **Abrégé/Abstract:**

A thread protector comprises a substantially closed end and a threaded inner annular wall extending from the substantially closed end. There is a detent disposed within an interior of the thread connector. The detent includes a resilient flap with an edge which is spaced-apart from and facing the threaded inner annular wall of the thread protector.

ABSTRACT OF THE DISCLOSURE

A thread protector comprises a substantially closed end and a threaded inner annular wall extending from the substantially closed end. There is a detent disposed within an interior of the thread connector. The detent includes a resilient flap with an edge which is spaced-apart from and facing the threaded inner annular wall of the thread protector.

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PIPE THREAD PROTECTOR WITH A DETENT

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BACKGROUND OF THE INVENTIONField of the Invention

[0001] The present invention relates to thread protectors and, in particular, to a thread
10 protector with a detent to restrain the thread protector against rotation relative to a
threaded pipe end.

Description of the Related Art

[0002] It is known to use thread protectors to protect threaded pipe ends from damage
15 during storage and transport. For example, United States Patent Number 4,139,023
discloses a pipe thread protector which is made of a resilient material and has a cup-
shaped body which overlies the pipe threads to be protected. The outermost portion of the
cup-shaped body is provided with protector threads complementary to the pipe threads.
Inwardly of the protector threads, the cup-shaped body is provided with a plurality of
20 tapered wedging ribs. These wedging ribs automatically center the cup-shaped body on
the threaded pipe end as the pipe thread protector is urged over the pipe end for
subsequent engagement of the protector threads with the pipe threads. The wedging ribs
thereafter frictionally restrain the protector against rotation relative to the pipe end.

[0003] United States Patent Number 4,553,567 discloses a protector for a threaded
25 end section of a cylindrical part, such as pipe, which has a tubular body having a plurality
of flexible ribs projecting from a wall of the body. The ribs, in an unflexed condition,
extend at an acute angle in a forward direction toward the pipe upon which the protector
is placed on the threaded end section of the pipe. The body is disposed in space
telescoped confronting relation to the threaded end section of the pipe to preclude
30 circumferential and radial destructive stress between the body and the threaded end of the

pipe. In one embodiment the ribs comprise first ribs engageable with the threaded end section of the pipe and second ribs located adjacent the first ribs in holding engagement with the threaded end section of the pipe.

5 [0004] It is of utmost importance that thread protectors do not loosen or fall off during use and expose pipe threads. A pipe is subject to vibration loading when it is transported in the form of a flat-bed truck or rail. Vibrations can cause prior art protectors to loosen or fall off and expose the pipe threads to severe damage. The problem is made worse under extreme weather conditions when hot temperatures cause female thread protectors to expand and cold temperatures cause male thread protectors to shrink.
10 Changes in diameter caused by temperature fluctuations can make HDPE thread protectors extremely susceptible to disengaging from the pipe threads and vibrating loose.

SUMMARY OF THE INVENTION

15 [0005] It is an object of the present invention to provide a thread protector with an improved detent to restrain the thread protector against rotation relative to a threaded pipe end.

[0006] There is accordingly provided a thread protector provided with a detent to resist rotational motion of the thread protector relative to a threaded pipe end.

20 [0007] A male one of thread protectors comprises a substantially closed end and a threaded outer annular wall extending from the substantially closed end. There is a detent disposed on the threaded outer annular wall. The detent is a resilient member which interrupts threading on the threaded outer annular wall of the thread protector.

[0008] The detent may be a resilient member which is press fit into a recess in the threaded outer annular wall of the male thread protector. The male thread protector may
25 include an annular flange at an open end thereof. There may be spaced-apart bumpers

extending circumferentially along the annular flange. The bumpers may be crescent-shaped and each bumper may have a crescent-shaped recess. There may be an opening which extends through the substantially closed end of the male thread protector.

5 [0009] A female one of thread protectors comprises a substantially closed end and a threaded inner annular wall extending from the substantially closed end. There is a detent disposed within an interior of the female thread connector. The detent includes a resilient flap with an edge which is spaced-apart from and facing the threaded inner annular wall of the female thread protector.

10 [0010] The female thread protector may include an elongate member extending from the substantially closed end and a socket in the resilient flap. The elongate member may be received by the socket. The elongate member may extend from the substantially closed end of the female thread protector in a direction parallel to a longitudinal axis of the female thread protector. The female thread protector may also include three elongate members extending from the substantially closed end and three sockets in the resilient
15 flap. Each elongate member may be received by a corresponding one of the sockets.

[0011] There may be a tab extending substantially perpendicular from the resilient flap of the female protector. There may be a plurality of spaced-apart ribs extending about and between the threaded inner annular wall and the substantially closed end of the female thread protector. There may be an annular ring which passes through the ribs. The
20 female thread protector may include spaced-apart bumpers extending circumferentially along the substantially closed end thereof. The bumpers may be crescent-shaped and each bumper may have a crescent-shaped recess. There may be an opening which extends through the substantially closed end of the female thread protector.

25 [0012] A combination of a pipe and a thread protector comprises a pipe with an inner wall and a male threaded pipe end and a thread protector with a substantially closed end and a threaded inner annular wall extending from the substantially closed end. There is a detent disposed within an interior of the thread protector. The detent includes a resilient

flap with an edge which is spaced-apart from and facing the threaded inner annular wall of the thread protector. The detent frictionally engages the inner wall of the pipe when the threaded pipe end of the pipe and the thread protector are threadedly engaged, thereby resisting rotational motion of the thread protector relative to the threaded pipe end of the
5 pipe

[0013] The thread protectors disclosed herein address the deficiencies of known thread protectors with the addition of a detent that resists rotational motion of the thread protector under various temperatures.

BRIEF DESCRIPTIONS OF DRAWINGS

10

[0014] The invention will be more readily understood from the following description of the embodiments thereof given, by way of example only, with reference to the accompanying drawings, in which:

[0015] Figure 1 is a perspective view of an improved male thread protector;

15 **[0016]** Figure 2 is another perspective view of the male thread protector;

[0017] Figure 3 is a sectional view of the male thread protector;

[0018] Figure 4 is a perspective, exploded view of the male thread protector and a female threaded pipe end;

[0019] Figure 5 is a perspective view showing the male thread protector partially
20 threaded into the female threaded pipe end;

[0020] Figure 6 is a perspective view showing the male thread protector fully threaded into the female threaded pipe end;

[0021] Figure 7 is a sectional view showing the detents of the male thread protector frictionally engaging threading of the female threaded pipe end;

[0022] Figure 8 is a perspective view of an improved female thread protector;

[0023] Figure 9 is another perspective view of the female thread protector;

5 [0024] Figure 10 is a sectional view of the female thread protector;

[0025] Figure 11 is another sectional view of the female thread protector showing the female thread protector engaged with a male threaded pipe end;

[0026] Figure 12 is a perspective, exploded view of the female thread protector and a male threaded pipe end;

10 [0027] Figure 13 is perspective view showing the female thread protector partially threaded about the male threaded pipe end;

[0028] Figure 14 is perspective view showing the female thread protector fully threaded about the male threaded pipe end; and

[0029] Figure 15 is a perspective end view of the female thread protector.

15 DESCRIPTIONS OF THE PREFERRED EMBODIMENTS

[0030] Referring to the drawings and first to Figure 1, an improved male thread protector 10 for protecting a female threaded pipe end is shown. The male thread protector 10 has a male threaded annular wall 12 which extends between an open end 14, which is best shown in Figure 1, and a substantially closed end 16 which is best shown in Figure 2. The threaded annular wall 12 is an outer annular wall of the male thread

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protector 10. There is an annular flange 18 at the open end 14 of the male thread protector 10. Spaced-apart bumpers 20, 22, 24 and 26 extend circumferentially along the annular flange 18. The bumpers assist in impact protection. The bumpers are each crescent-shaped and are provided with a respective central recess, for example, a crescent-shaped
 5 recess 28 as shown for one of the ribs 20 in Figure 1. The recesses in the bumpers may receive an installation or removal tool and also reduce the material required to make the male thread protector. There is a small opening 29, shown in Figure 2, which extends through the substantially closed end 16 of the male thread protector 10. The opening allows airflow through the pipe to minimize condensation.

10 [0031] The male thread protector 10 is also provided with a plurality of spaced-apart detents, for example detents 30 and 32, in the threaded annular wall 12. The detents 30 and 32 interrupt threading on the threaded annular wall 12. In this example, the detents 30 and 32 are resilient and are made of an elastomeric material. As shown in Figure 3, for one of the detents 30, the detent 30 is press fit into a corresponding recess 34 in the
 15 threaded annular wall 12 of the male thread protector 10. Referring now to Figures 4 to 6, the detents 30 and 32 come into frictional engagement with threading 36 of a female threaded pipe end 38 when the male thread protector 10 is threaded into the female threaded pipe end 38 to resist rotational motion of the male thread protector. This will necessitate an additional rotational force to thread the male thread protector 10 into the
 20 female threaded pipe end 38. An additional rotational force will also be required to unthread the male thread protector 10 from the female threaded pipe end 38. This helps ensure that the male thread protector 10 is not unintentionally loosened or removed from the female threaded pipe end 38. Figure 7 shows the detent 30 frictionally engaging the threading 36 of a female threaded pipe end 38.

25 [0032] An improved female thread protector 50 is shown in Figures 8 and 9. The female thread protector 50 has a female threaded annular wall 52 which extends between an open end 54, which is best shown in Figure 8, and a substantially closed end 56 which is best shown in Figure 9. The threaded annular wall 52 is an inner annular wall of the female thread protector 50. Spaced-apart bumpers 58, 60, 62 and 64 extend

circumferentially along the substantially closed end 56 of the female thread protector 50. The bumpers assist in impact protection. The bumpers are crescent-shaped and each is provided with a central recess, for example, a crescent shaped recess 66 as shown for one of the bumpers 58 in Figure 9. The recesses in the bumpers may receive an installation or
 5 removal tool and also reduce the material required to make the female thread protector. There is a generally cylindrical recess 68 in the substantially closed end 56 of the female thread protector 50. The recess 68 is concentric with the threaded annular wall 52 and thus provides an interior of the female thread protector 50 with an annular interior portion as can best be seen in Figure 10.

10 [0033] A plurality of spaced-apart impact energy absorbing ribs, for examples ribs 72 and 74, extend about and between the threaded annular wall 52 and the substantially closed end 56 of the female thread protector 50. The ribs extend radially as best seen in Figure 15. These ribs provide a crash zone which helps protect the pipe if the female thread protector is subject to an impact. There is also a solid annular ring 75, shown in
 15 Figures 10 and 15, which passes through the ribs to provide a seal between the end of the pipe and the female thread protector by eliminating interruptions by the ribs. There is a small opening 76, shown in Figures 8 and 10, which extends through the substantially closed end 56 of the female thread protector 50. The opening allows airflow through the pipe to minimize condensation.

20 [0034] The female thread protector 50 is also provided with a detent 78 shown in Figures 10 and 15. In this example, the detent includes a resilient flap or flange 83 mounted on three elongate members 80a, 80b and 80c. The elongate members 80a, 80b and 80c extend from the substantially closed end 56 of the female thread protector 50 in a direction parallel to a longitudinal axis 100 of the female thread protector. The resilient
 25 flange 83 has three sockets 81a, 81b and 81c. As shown in Figure 10 for one of the three sockets 81a, the socket 81a fits tightly over an outer end 79 of the elongate member 80a. The resilient flange 83 extends in a plane generally perpendicular to the longitudinal axis 100 of the female thread protector 50. The resilient flange 83 has an outer edge 84 which is spaced-apart from and faces the threaded annular wall 52. There is a tab 82 extending

from the resilient flange 83 generally parallel to the elongate members 80a, 80b and 80c when the resilient flange 83 is substantially planar as shown in Figure 10. The tab 82 may facilitate coupling and decoupling of resilient 83 and the three elongate members 80a, 80b and 80c. Referring now to Figure 11, the resilient flange 83 of the detent 78 comes
5 into frictional engagement with an inner wall 86 of a male threaded pipe end 88 when the female thread protector 50 is threaded onto the male threaded pipe end 88. In particular, the resilient flange 83 flexes and frictional engages the inner wall 86 of a male threaded pipe end 88. The detent 78 thus resists rotational motion of the female thread protector 50. This necessitates an additional rotational force to allow the female thread protector 50
10 to be threaded into the male threaded pipe end 88. An additional rotational force will also be required to unthread the female thread protector 50 from the male threaded pipe end 88 to resist inadvertent loosening or removal of the thread protector with respect to the pipe. Figures 12 to 14 show the female thread protector 50 being threaded onto the male threaded pipe end 88.

15 [0035] It will be understood by a person skilled in the art that many of the details provided above are by way of example only, and are not intended to limit the scope of the invention which is to be determined with reference to the following claims.

What is claimed is:

1. A male thread protector comprising:

a substantially closed end;

a threaded outer annular wall extending from the substantially closed end; and

a detent disposed on the threaded outer annular wall, wherein the detent is a resilient member which interrupts threading on the threaded outer annular wall.
2. The male thread protector as claimed in claim 1 wherein the detent is a resilient member which is press fit into a recess in the threaded outer annular wall.
3. The male thread protector as claimed in claim 1 or 2 further including an annular flange at an open end thereof and spaced-apart bumpers extending circumferentially along the annular flange.
4. The male thread protector as claimed in claim 3 wherein the bumpers are crescent-shaped and each have a crescent-shaped recess.
5. The male thread protector as claimed in any one of claims 1 to 4 further including an opening which extends through the substantially closed end thereof.
6. A female thread protector comprising:

a substantially closed end;

a threaded inner annular wall extending from the substantially closed end; and

a detent disposed within an interior of the female thread connector, wherein the detent includes a resilient flap with an edge which is spaced-apart from and facing the threaded inner annular wall.

7. The female thread protector as claimed in claim 6 further including an elongate member extending from the substantially closed end and a socket in the resilient flap, wherein the elongate member is received by the socket.
8. The female thread protector as claimed in claim 6 further including three elongate members extending from the substantially closed end and three sockets in the resilient flap, wherein each elongate member is received by a corresponding one of the sockets.
9. The female thread protector as claimed in claim 7 or 8 wherein the elongate member extends from the substantially closed end in a direction parallel to a longitudinal axis of the female thread protector.
10. The female thread protector as claimed in claim in any one of claims 6 to 9 further including a tab extending substantially perpendicular from the resilient flap.
11. The female thread protector as claimed in claim in any one of claims 6 to 10 further including a plurality of spaced-apart ribs extending about and between the threaded inner annular wall and the substantially closed end of the female thread protector.

12. The female thread protector as claimed in claim 11 further including an annular ring which passes through the ribs.
13. The female thread protector as claimed in any one of claims 6 to 12 further including spaced-apart bumpers extending circumferentially along the substantially closed end thereof.
14. The female thread protector as claimed in claim 13 wherein the bumpers are crescent-shaped and each have a crescent-shaped recess.
15. The female thread protector as claimed in in any one of claims 6 to 14 further including an opening which extends through the substantially closed end thereof.
16. A combination of a pipe and a thread protector:

the pipe having an inner wall and a male threaded pipe end; and

the thread protector having a substantially closed end, a threaded inner annular wall extending from the substantially closed end, and a detent disposed within an interior of the thread protector and which includes a resilient flap with an edge which is spaced-apart from and facing the threaded inner annular wall;

wherein the detent frictionally engages the inner wall of the pipe when the threaded pipe end of the pipe and the thread protector are threadedly engaged, thereby resisting rotational motion of the thread protector relative to the threaded pipe end of the pipe.

17. The combination of a pipe and a thread protector as claimed in claim 16 wherein the thread protector further includes an elongate member extending from the substantially closed end thereof and a socket in the resilient flap, wherein the elongate member is received by the socket.
18. The combination of a pipe and a thread protector as claimed in claim 16 or 17 wherein the thread protector further includes a plurality of spaced-apart ribs extending about and between the threaded inner annular wall and the substantially closed end of the thread protector, and wherein there is an annular ring which passes through the ribs.
19. The combination of a pipe and a thread protector as claimed in any one of claims 16 to 18 wherein the thread protector further includes spaced-apart bumpers extending circumferentially along the substantially closed end thereof, the bumpers being crescent-shaped and each having a crescent-shaped recess.
20. The combination of a pipe and a thread protector as claimed in any one of claims 16 to 19 wherein the thread protector further includes an opening which extends through the substantially closed end thereof.

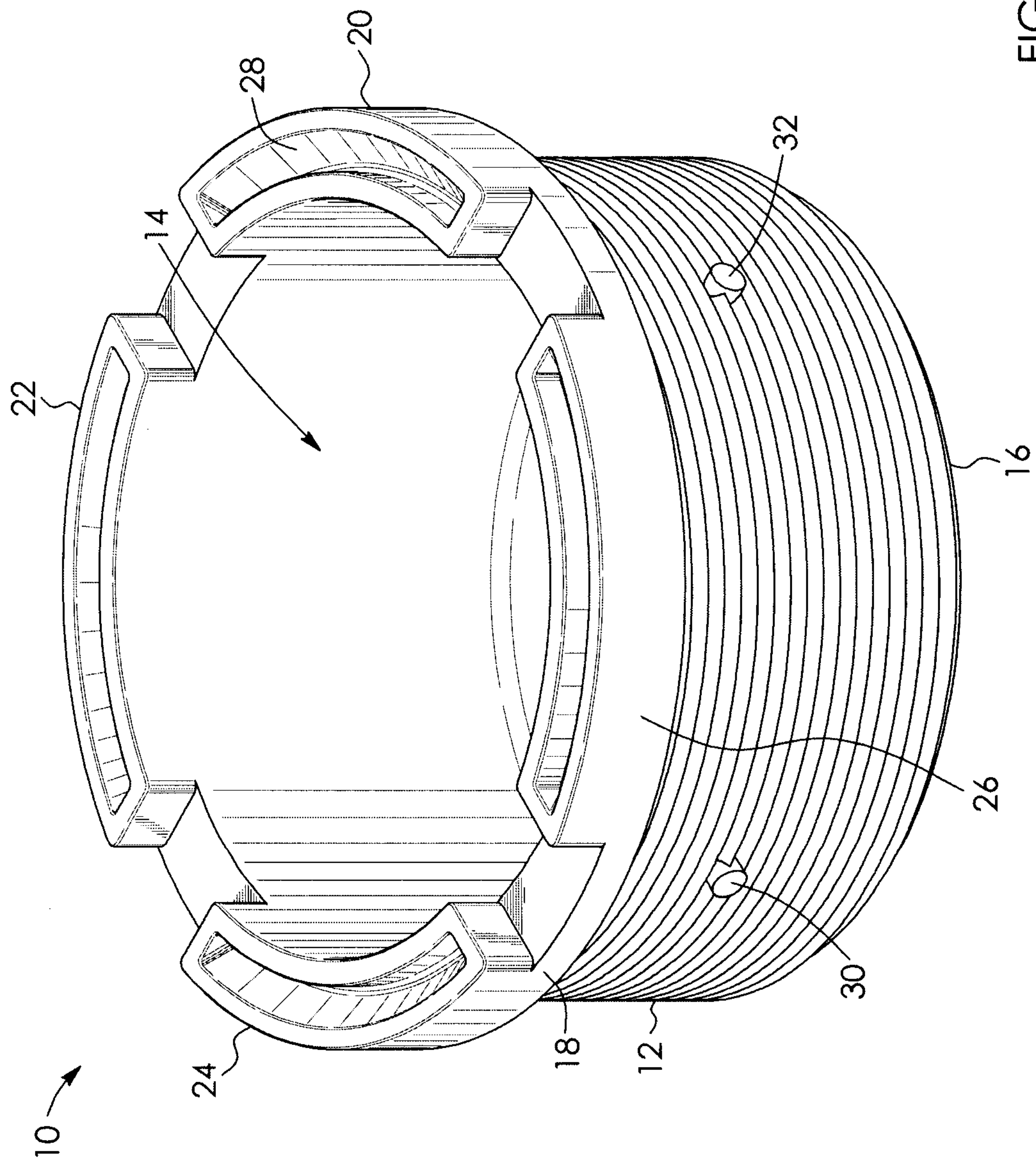


FIG. 1

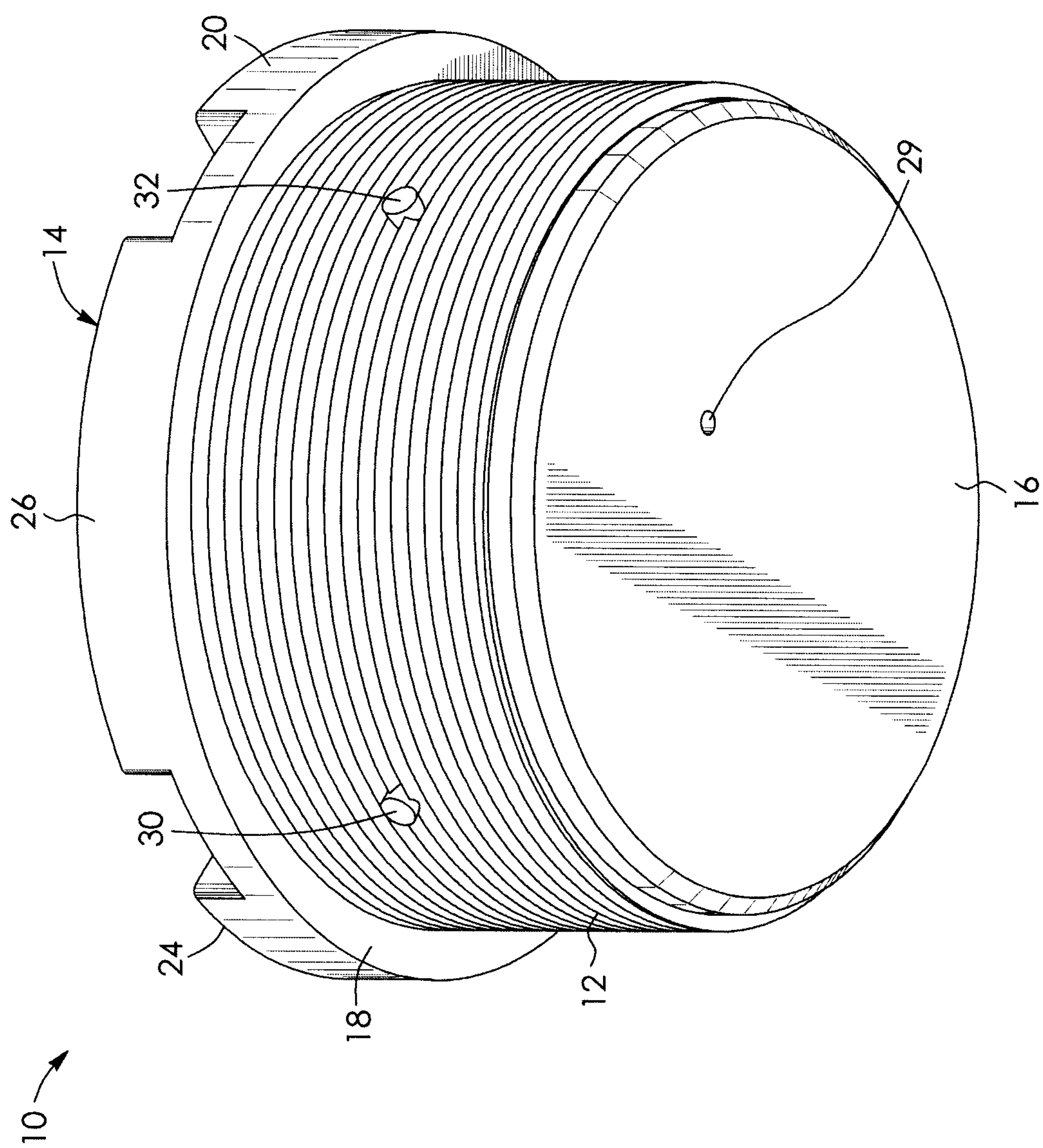


FIG. 2

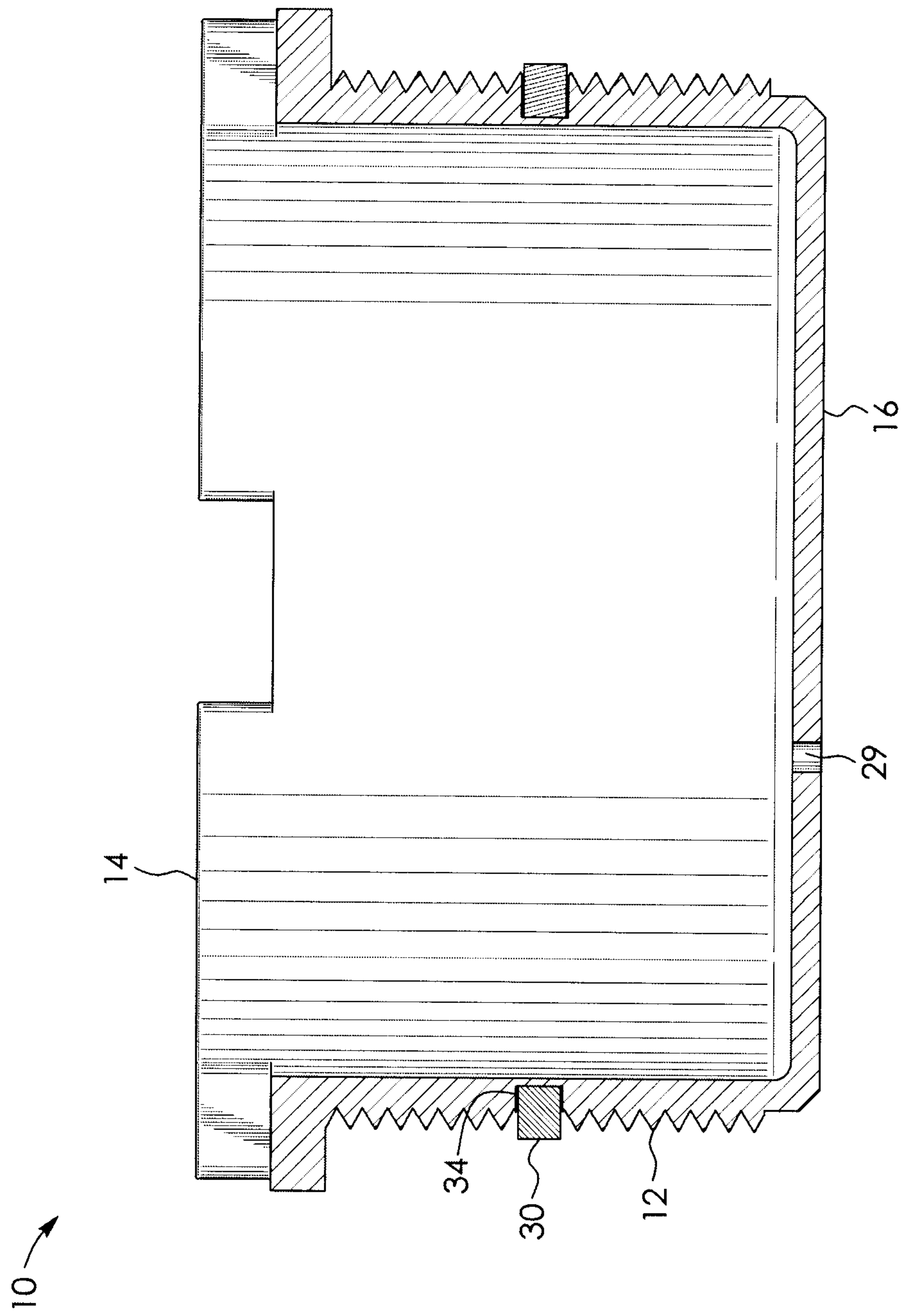


FIG. 3

FIG. 4

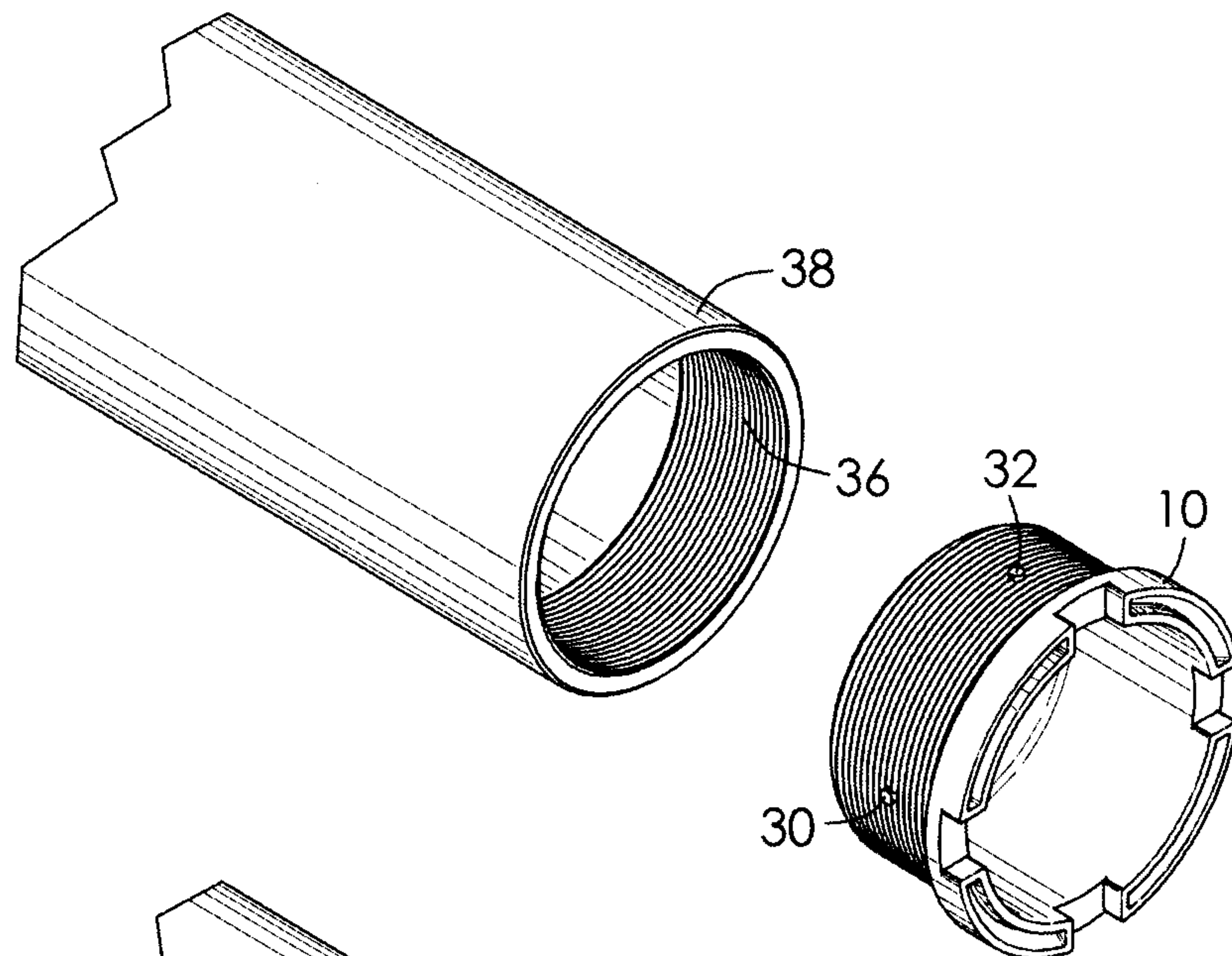


FIG. 5

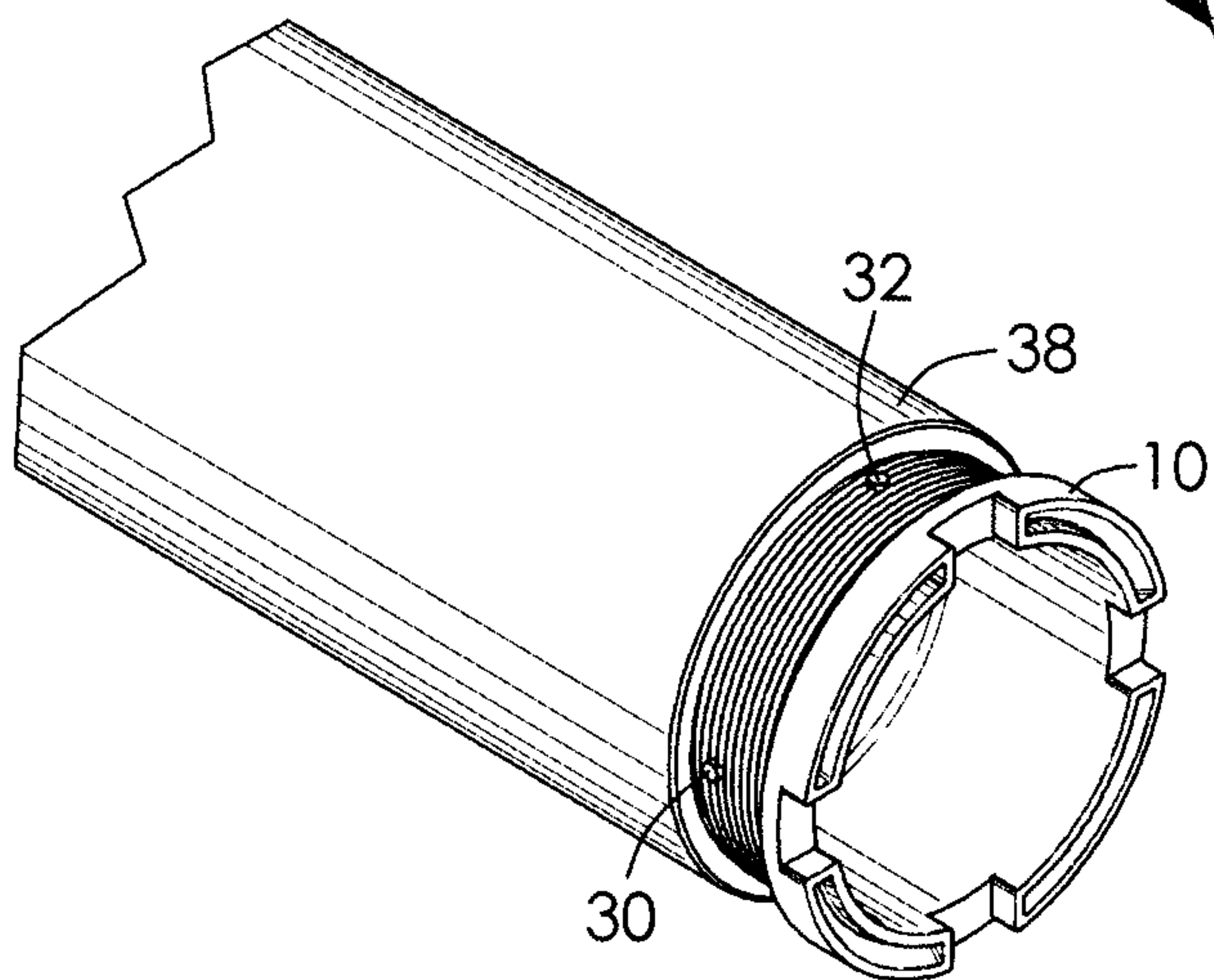
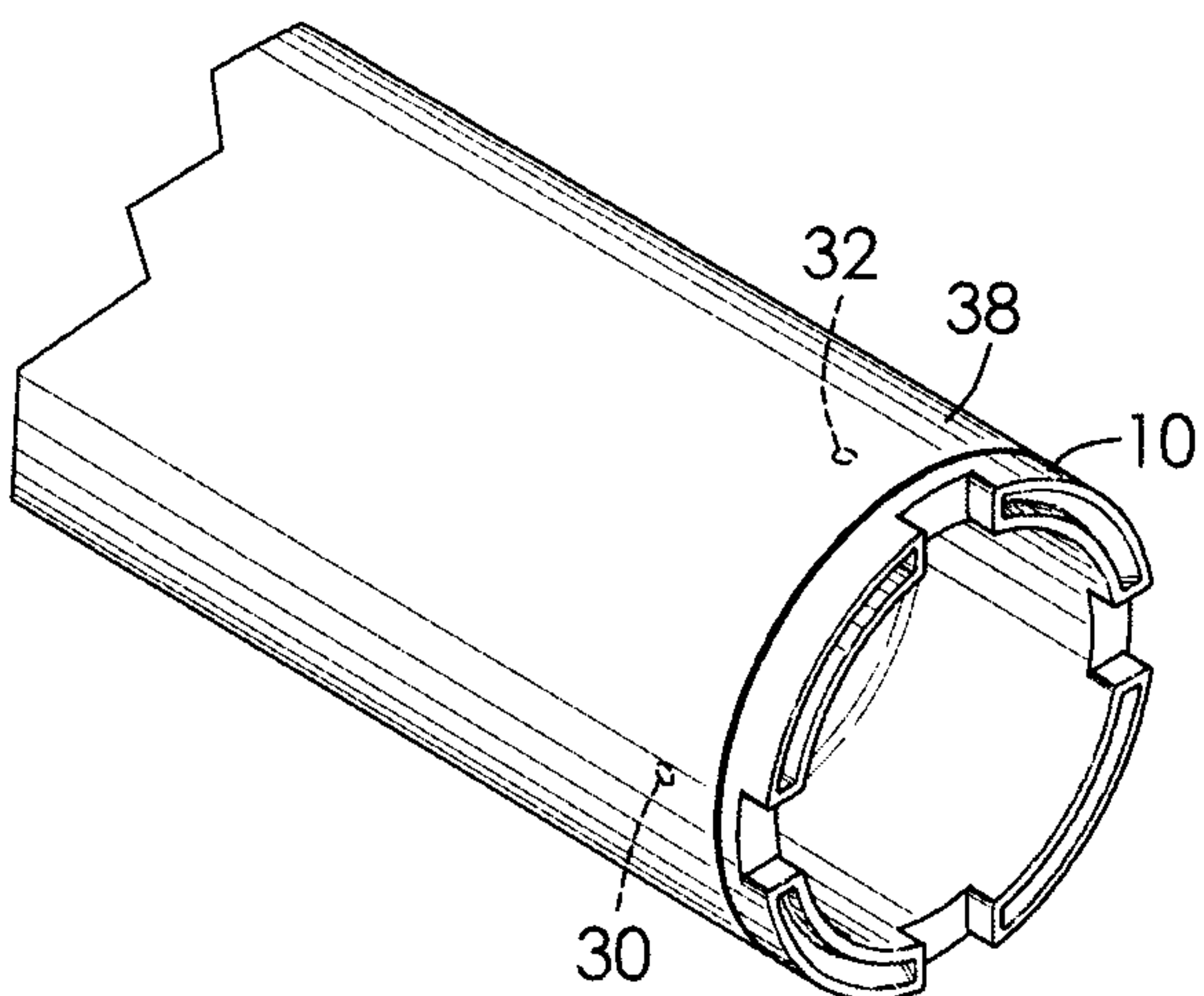


FIG. 6



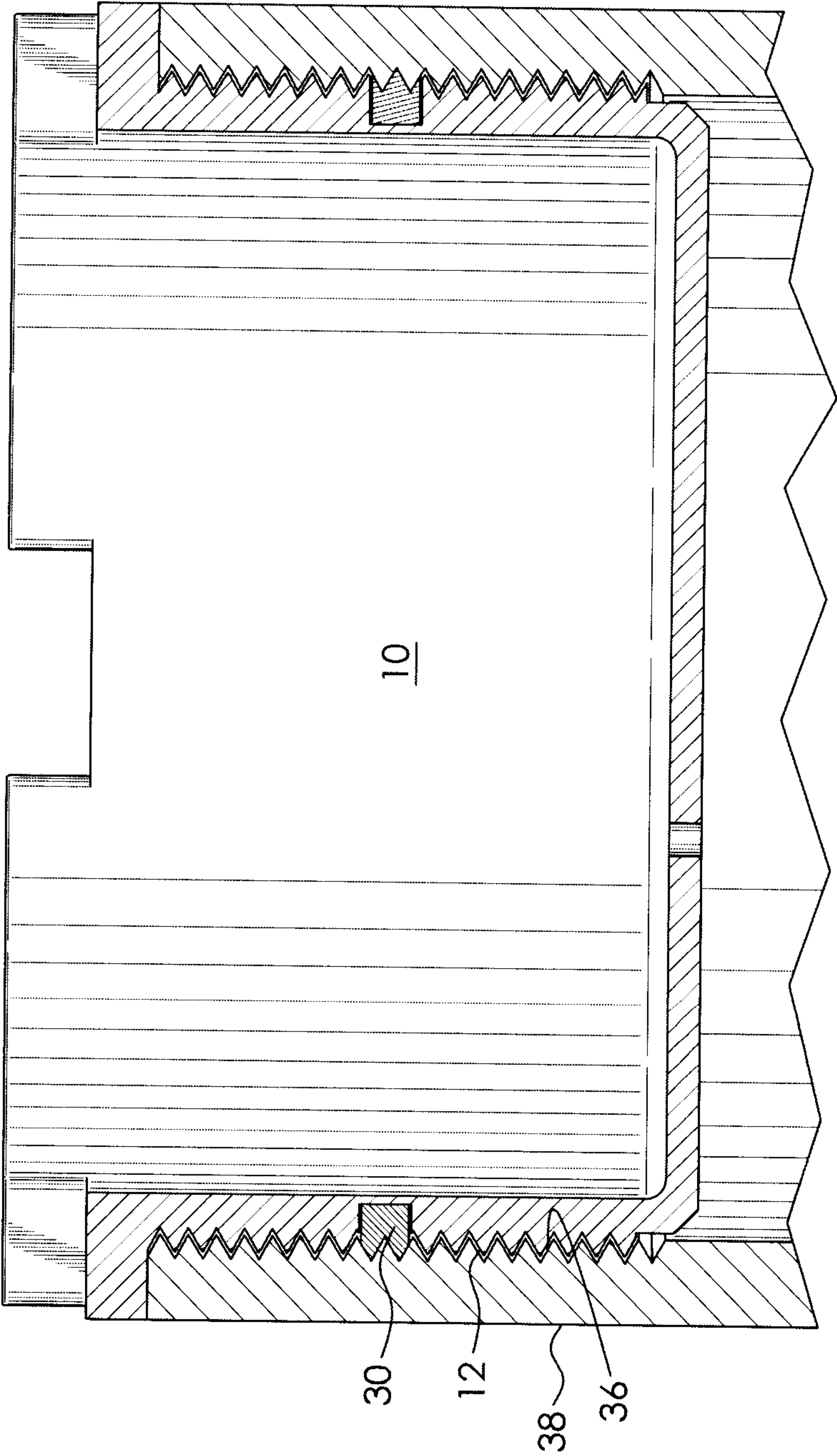


FIG. 7

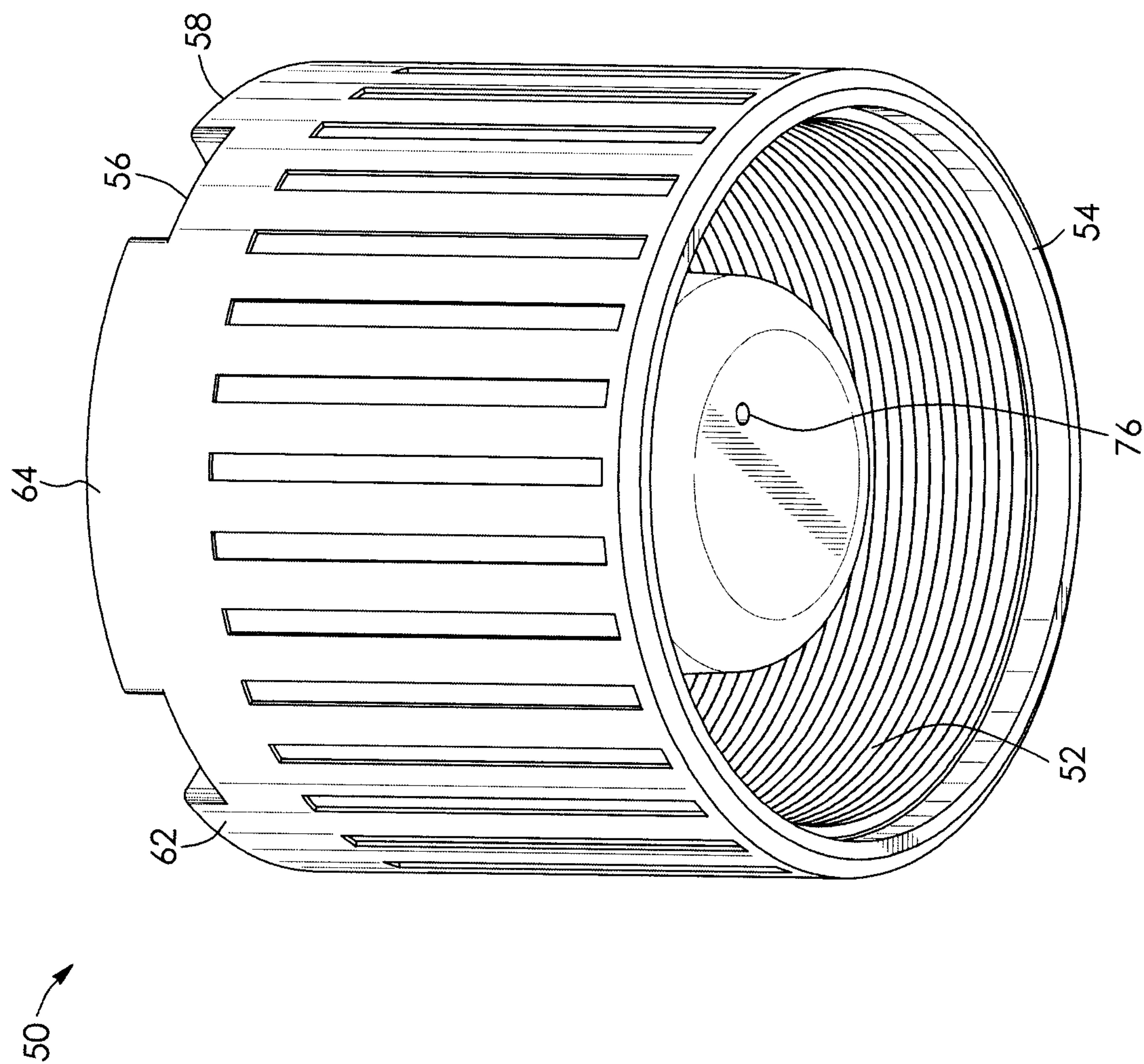


FIG. 8

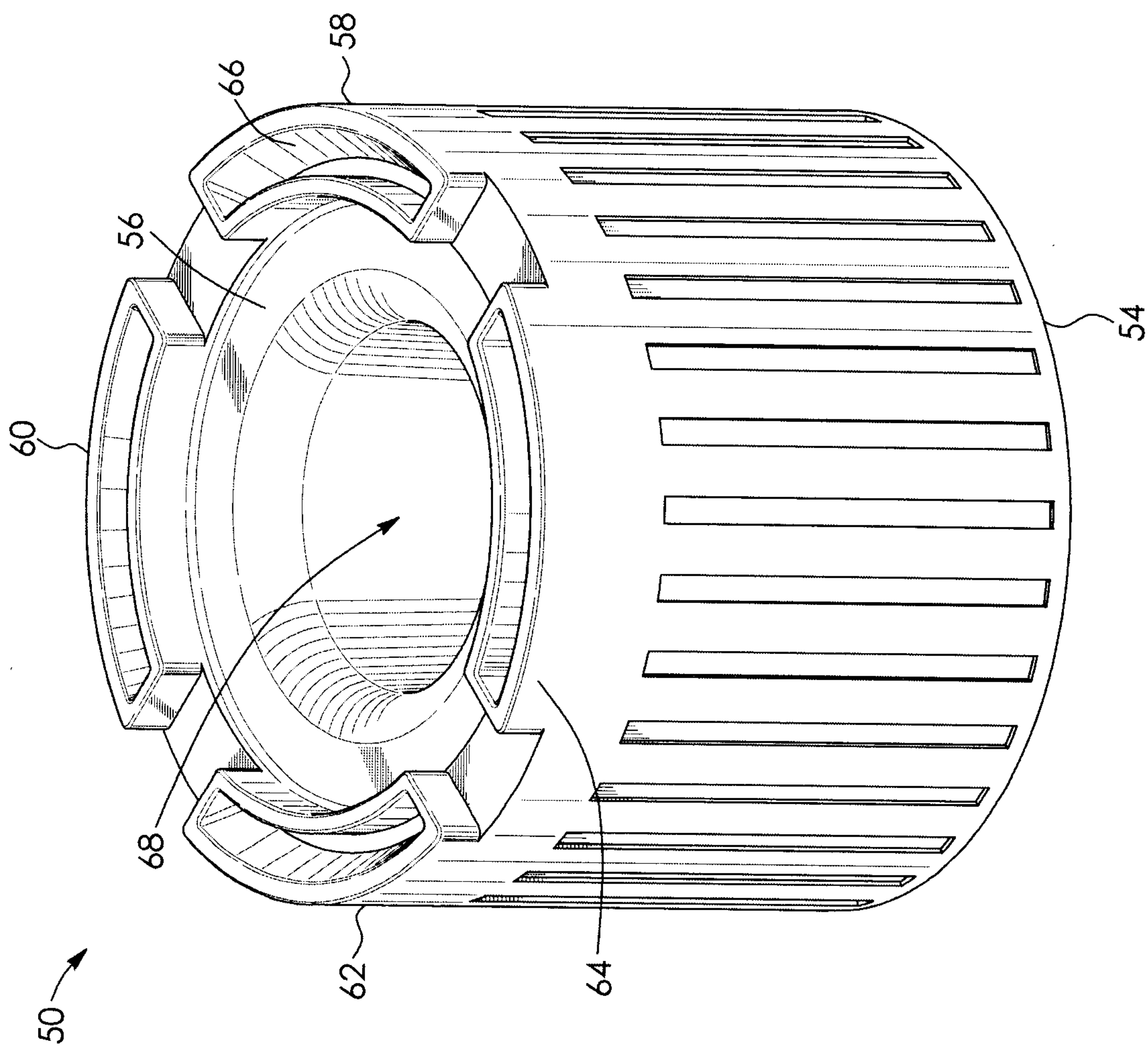


FIG. 9

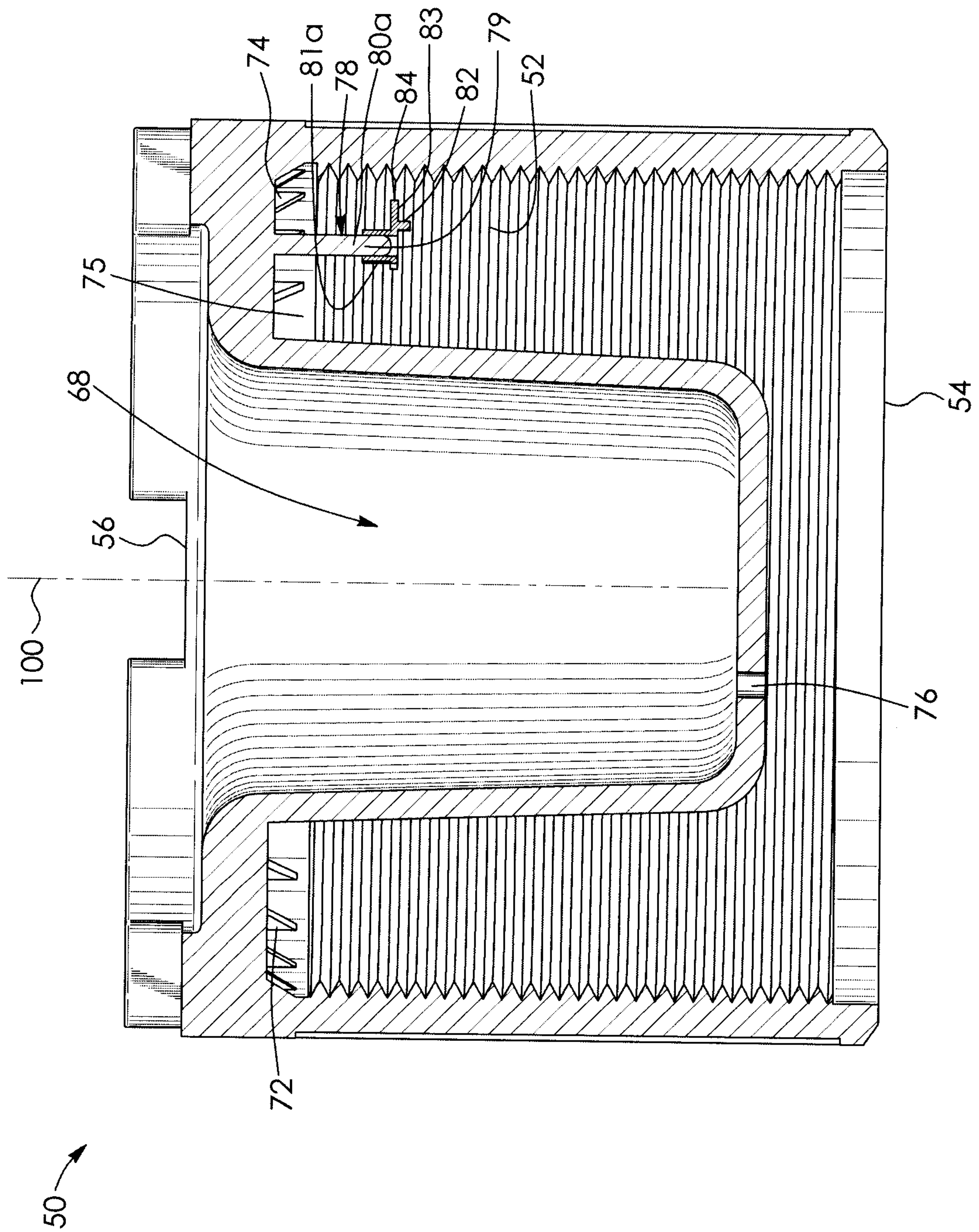


FIG. 10

50 →

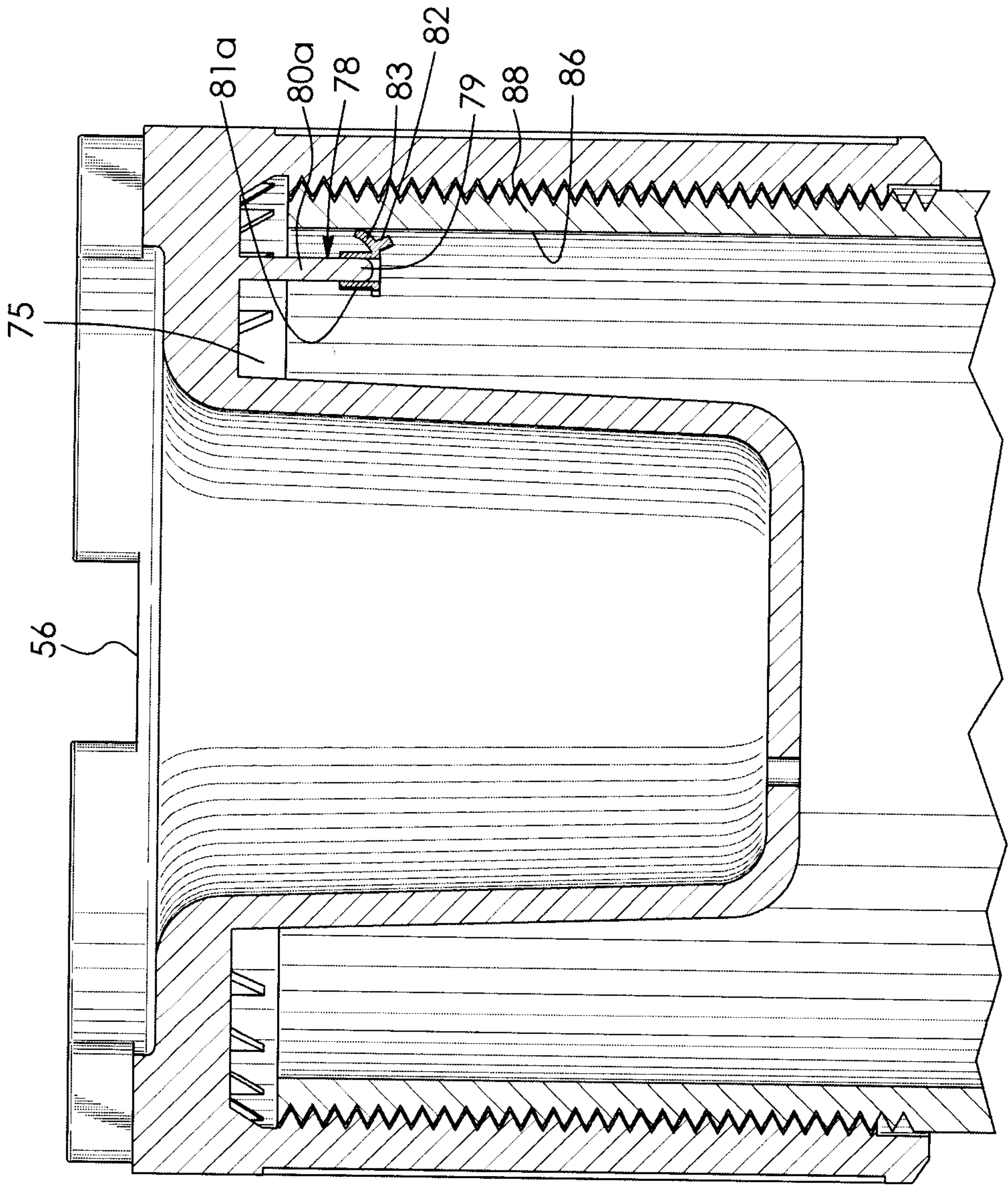


FIG. 11

FIG. 12

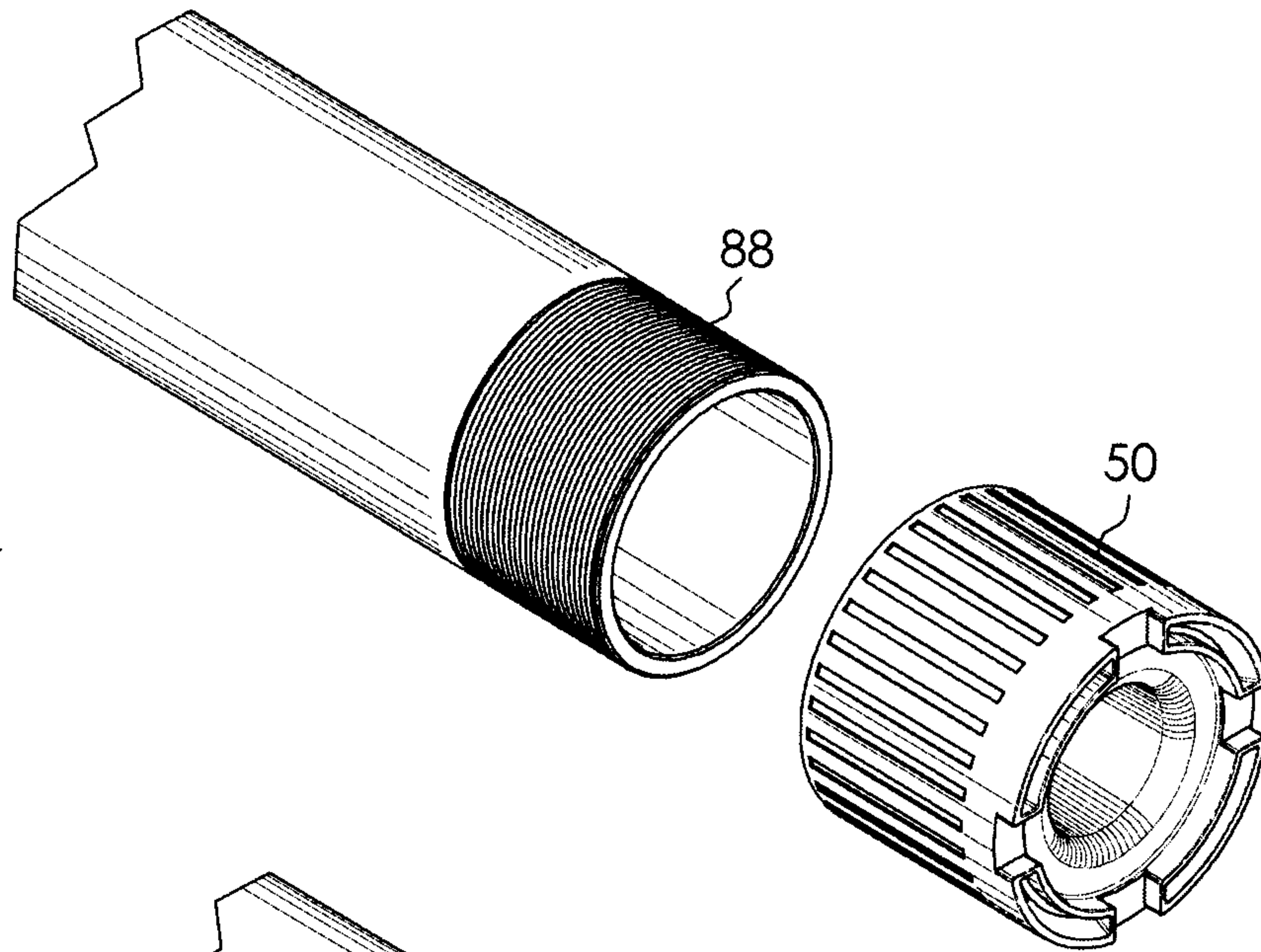


FIG. 13

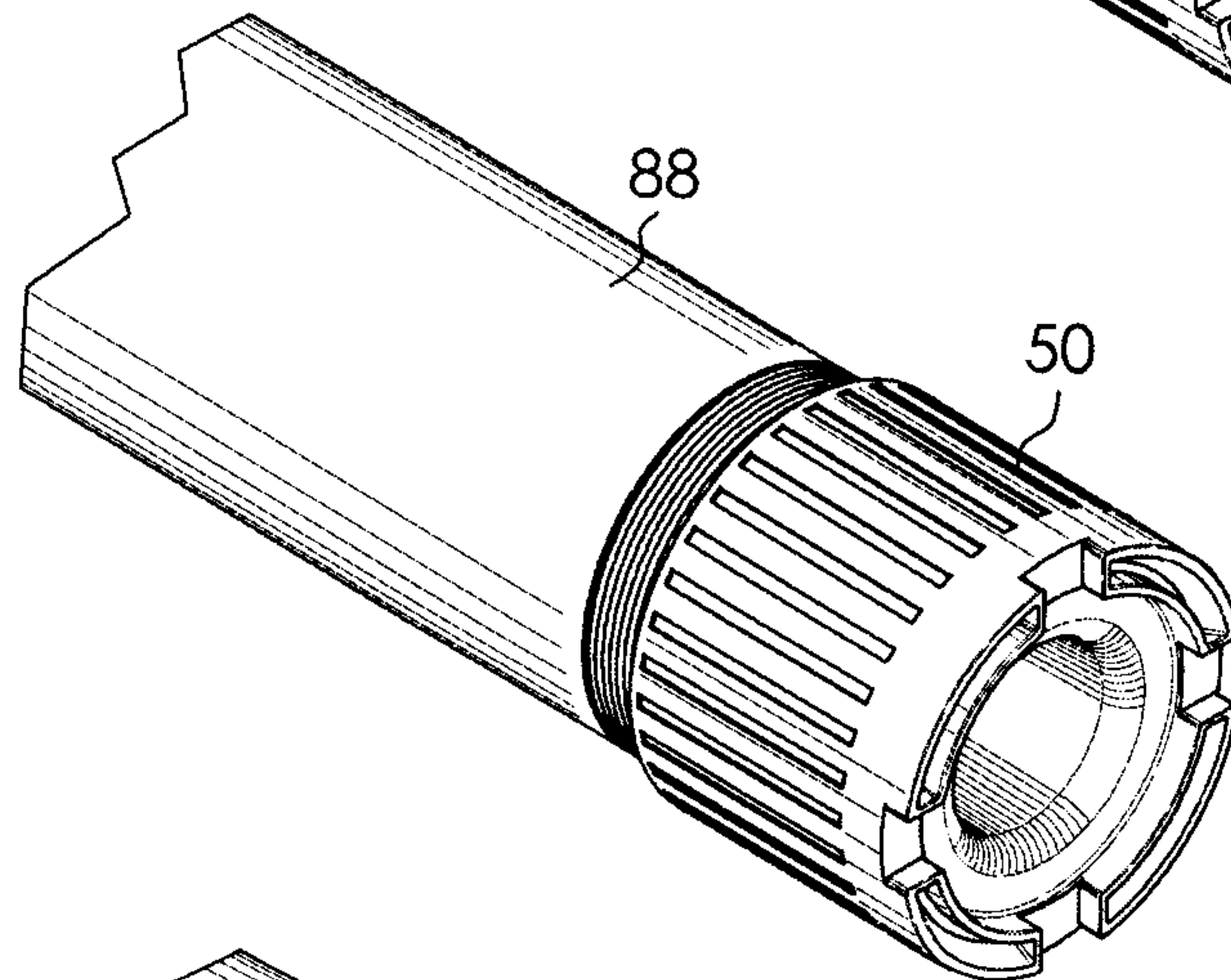
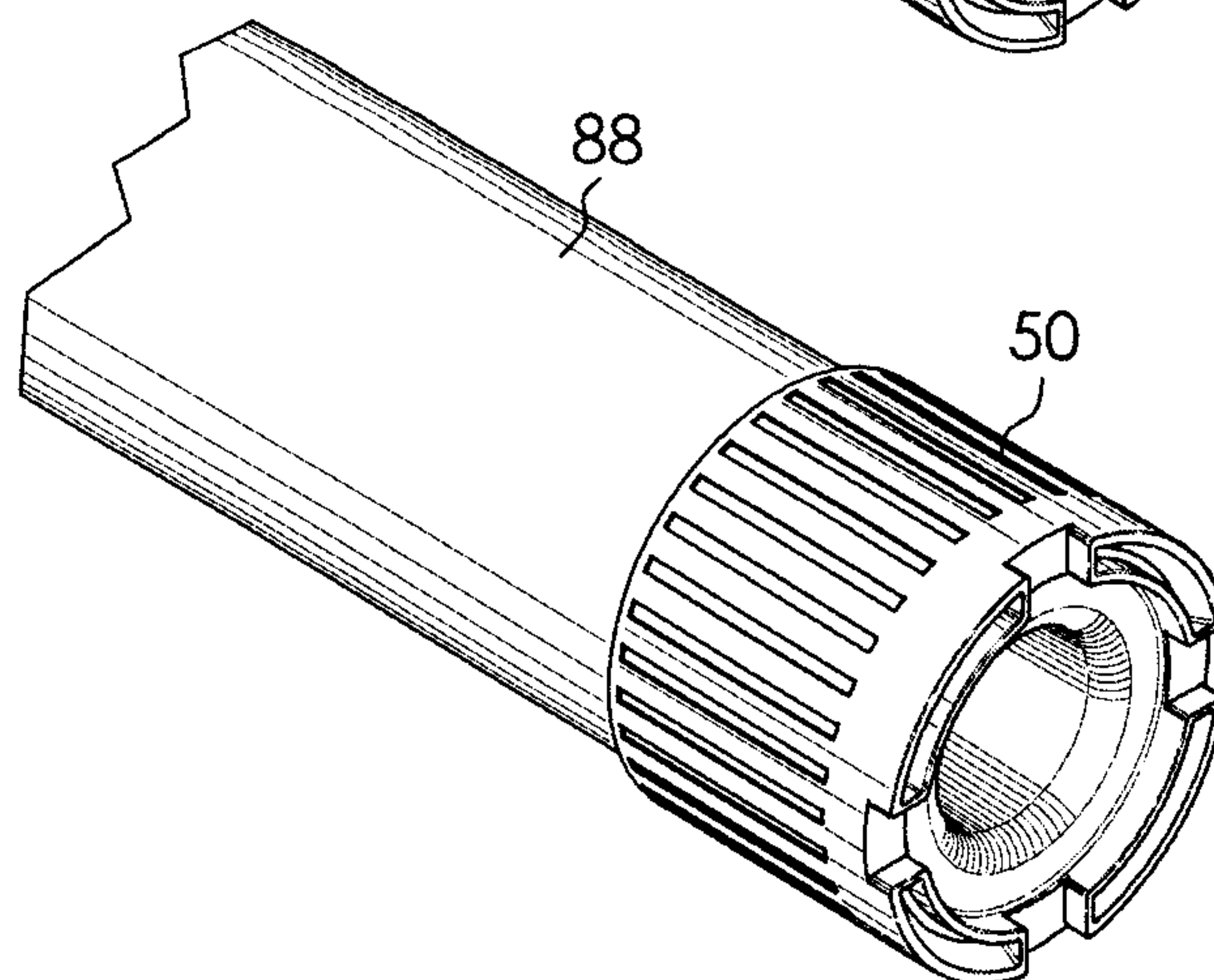


FIG. 14



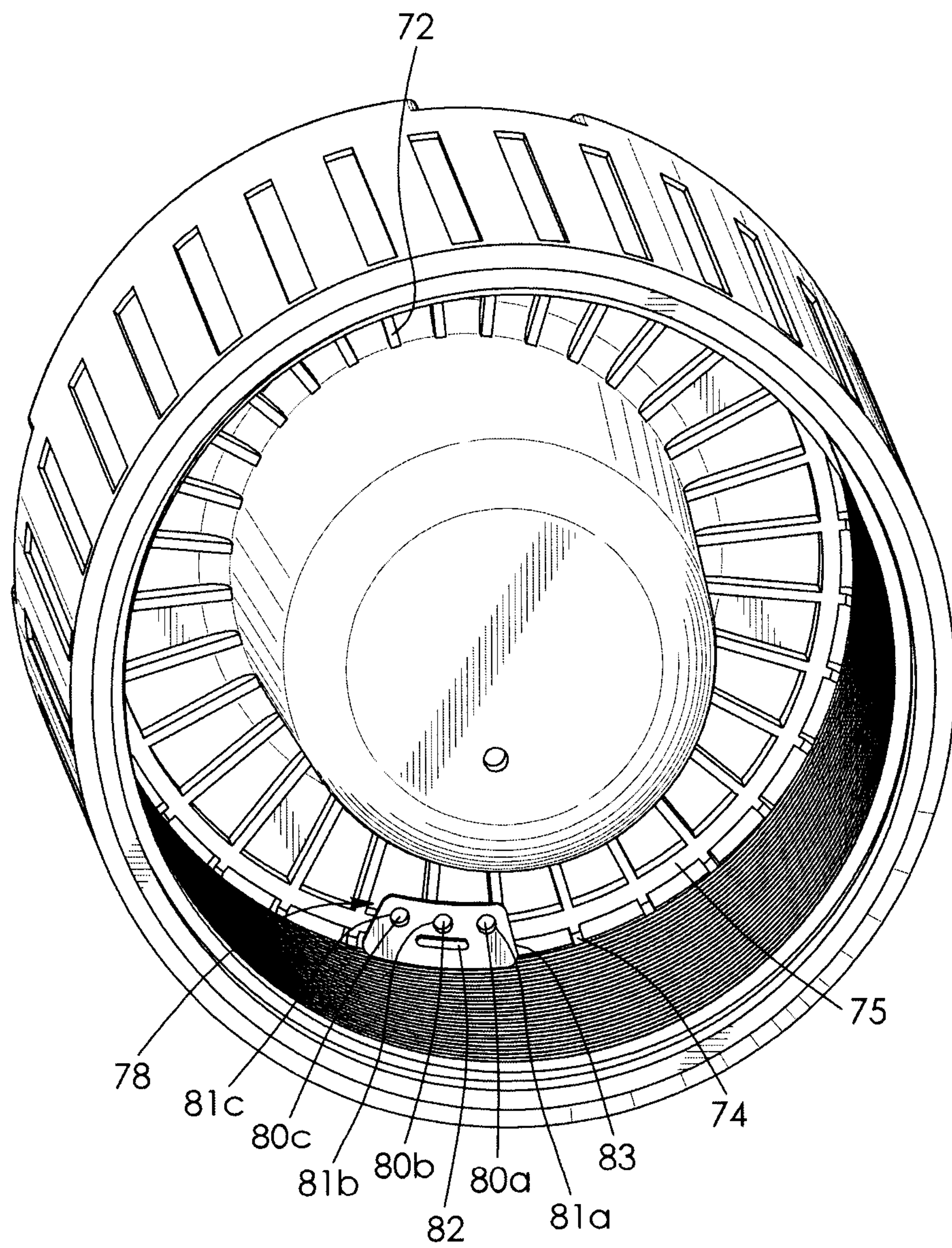


FIG. 15

