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(71) Ansøger: **Coloplast A/S, Holtedam 1, 3050 Humlebæk, Danmark**

(72) Opfinder: **Randy Lee Morningstar, 8116 Brandywine Parkway, MN 55444 Brooklyn Park, USA**

(54) Benævnelse: **Penile prosthetic with anti-autoinflation mechanism**

(57) Sammendrag:

A pump is provided for a body implantable prosthesis that includes a reservoir maintaining a fluid volume that is transferrable into a cylinder. The pump includes a pump bulb, an inlet valve, an exhaust valve, and an anti-autoinflation (AAI) valve. The pump bulb is connected to a pump body that is in fluid communication with the reservoir and the cylinder. The inlet valve is operable to allow a portion of the fluid volume to be drawn from the reservoir and delivered into the pump bulb. The exhaust valve is operable to allow the portion of the fluid volume delivered into the pump bulb to be pumped into the cylinder. The AAI valve is disposed in the pump body and has a seal that is biased to prevent fluid flow from bypassing the pump bulb and flowing from the reservoir to the cylinder.

fortsættes

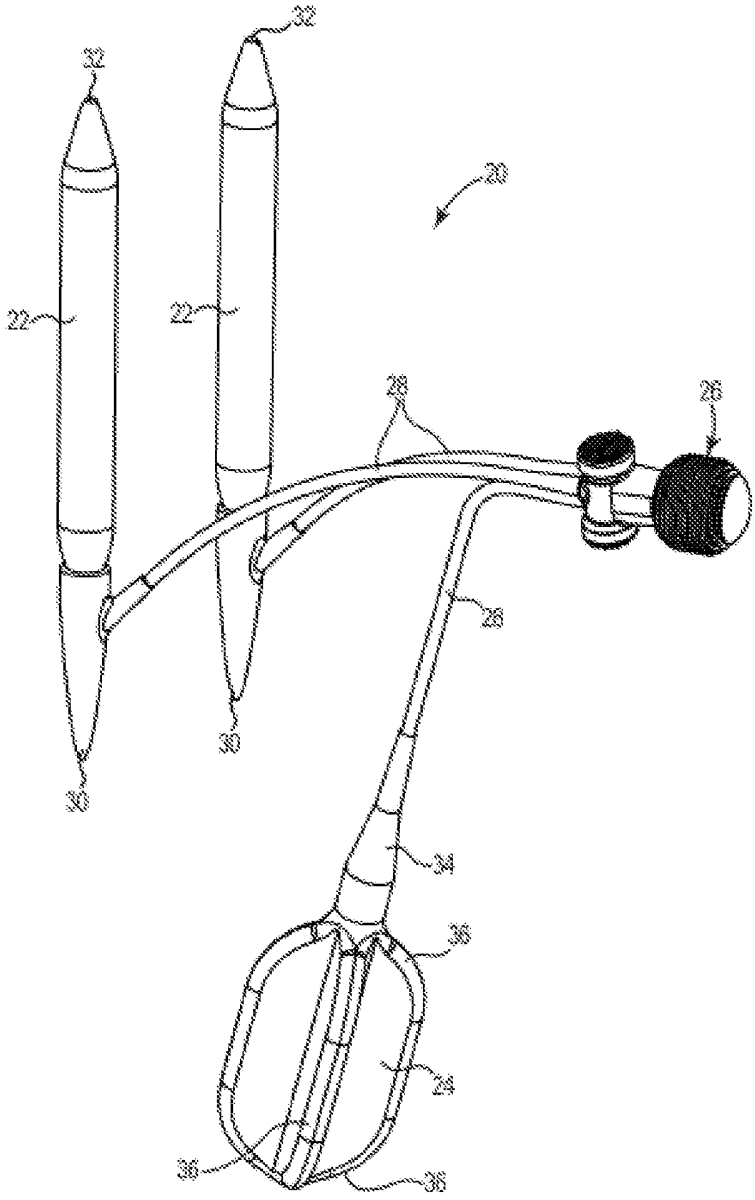

Fig. 1

WHAT IS CLAIMED IS:

1. A pump connected to a body implantable penile prosthesis including a reservoir maintaining a fluid volume that is transferrable into a cylinder of the penile prosthesis, the pump comprising:

a pump bulb connected to a pump body that is in fluid communication with the reservoir and the cylinder;

an inlet valve operable to allow a portion of the fluid volume to be drawn from the reservoir and delivered into the pump bulb;

an exhaust valve operable to allow the portion of the fluid volume delivered into the pump bulb to be pumped into the cylinder; and

an anti-autoinflation (AAI) valve disposed in the pump body and comprising a seal that is biased to prevent fluid flow from bypassing the pump bulb and flowing from the reservoir to the cylinder.

2. The pump of claim 1, wherein the seal of the AAI valve is conical with a first end that is wider than an opposing second end, the first end configured to block fluid from flowing through the pump body from the reservoir to the cylinder.

3. The pump of claim 2, wherein the conical seal is movable to allow fluid in the cylinder to flow past the second end of the seal, through the pump body, to the reservoir.

4. The pump of claim 1, wherein the AAI valve comprises a valve stem including a flange disposed on a first end portion, and a conical spring coupled axially to the valve stem between the flange and the seal, the conical spring configured to bias the seal away from the flange.

5. The pump of claim 1, wherein the AAI valve only allows fluid to be delivered into the cylinder via pumping of the pump bulb.

6. The pump of claim 1, wherein the inlet valve and the exhaust valve each comprises a one-way valve that communicates with the pump bulb, and the AAI valve is disposed transverse between the one-way inlet valve and the one-way exhaust valve.

7. A pump connected to an inflatable penile prosthesis including a reservoir maintaining a fluid volume that is transferrable into a cylinder of the penile prosthesis, the pump comprising:

a pump bulb connected to a body implantable pump body that is in fluid communication with the reservoir and the cylinder;

a first valve operable to allow a portion of the fluid volume to be drawn from the reservoir and delivered into the pump bulb;

a second valve operable to allow the portion of the fluid volume delivered into the pump bulb to be pumped into the cylinder; and

a third valve disposed in the pump body between the first and second valves that is configured to prevent fluid flow from the reservoir to the cylinder through the pump body.

8. The pump of claim 7, wherein the pump body is connected to the reservoir via a first tube and connected to the cylinder via a second tube.

9. The pump of claim 8, wherein each of the first tube and the second tube comprises flexible tubing.

10. The pump of claim 8, wherein the first valve is aligned axially between the pump bulb and the first tube, the second valve is aligned axially between the pump

bulb and the cylinder, and the third valve is disposed transverse between the first and second valves.

11. The pump of claim 7, wherein the third valve comprises a seal that is movable to allow fluid to flow transversely through the pump body from the cylinder to the reservoir and that is biased to prevent the fluid from flowing transversely through the pump body from the reservoir to the cylinder.

12. A pump connected to an inflatable penile prosthesis including a reservoir maintaining a fluid volume that is transferrable into a cylinder of the penile prosthesis, the pump comprising:

a pump bulb connected to a body implantable pump body that is in fluid communication with the reservoir and the cylinder;

a first valve operable to allow a portion of the fluid volume to be drawn from the reservoir and delivered into the pump bulb;

a second valve operable to allow the portion of the fluid volume delivered into the pump bulb to be pumped into the cylinder; and

means to prevent fluid flow from the reservoir to the cylinder transverse through the pump body.

13. The pump of claim 12, wherein the means to prevent fluid flow from the reservoir to the cylinder transverse through the pump body includes means to allow the fluid flow from the cylinder to the reservoir through the pump body.

14. A penile prosthetic comprising:

a cylinder configured for implantation into the penis;

a reservoir maintaining a fluid volume that is transferrable into the cylinder; and

a pump comprising a pump bulb connected to a pump body that is in fluid communication with the reservoir and the cylinder, an inlet valve operable to allow a portion of the fluid volume to be drawn from the reservoir to the pump bulb, an exhaust valve operable to allow the portion of the fluid volume in the pump bulb to be pumped into the cylinder, and an anti-autoinflation (AAI) valve disposed in the pump body transverse between the inlet valve and the exhaust valve;

wherein the AAI valve comprises a seal that is movable to allow fluid to flow transversely through the pump body from the cylinder to the reservoir and that is biased to prevent the fluid from flowing transversely through the pump body from the reservoir to the cylinder.

15. The penile prosthetic of claim 14, comprising a pair of cylinders configured for implantation into the penis, each cylinder connected to the pump body via tubing, and the exhaust valve communicating with the tubing and operable to pump fluid into the pair of cylinders.

16. The penile prosthetic of claim 14, wherein the seal is movable during deflation of the cylinder to allow the fluid to flow transversely through the pump body from the cylinder to the reservoir and the AAI valve comprises a crown that is configured to seal during inflation of the cylinder and prevent the portion of the fluid volume moving from the pump bulb to the cylinder from flowing to the reservoir.

17. A method of providing an inflatable penile prosthetic device to a user, the method comprising:

connecting a pump body with a reservoir sized to maintain a fluid volume that is transferrable into a cylinder of the penile prosthetic device;

configuring the pump body to selectively inflate the cylinder of the penile prosthetic device with a portion of the fluid volume maintained in the reservoir; and

configuring the pump body to prevent the fluid volume from flowing from the reservoir to the cylinder transversely through the pump body.

18. The method of claim 17, wherein configuring the pump body to prevent the fluid volume from flowing from the reservoir to the cylinder transversely through the pump body comprises configuring the pump body to allow the fluid volume to flow from the reservoir to the cylinder through the pump bulb.

19. A method of preventing autoinflation of a penile prosthetic device, the method comprising:

connecting a pump body to a reservoir that is sized to maintain a fluid volume that is transferrable to a cylinder of the penile prosthetic device; and

sealing the pump body to prevent the fluid volume from flowing from the reservoir transversely through the pump body to the cylinder of the penile prosthetic device.

20. The method of claim 19, further comprising:

forming a transverse drain flow path that extends from the cylinder of the penile prosthetic device to the reservoir.

21. The method of claim 20, wherein sealing the pump body comprises inserting an anti-autoinflation (AAI) valve in the pump body, and forming a transverse drain flow path that extends from the cylinder of the penile prosthetic device to the reservoir comprises displacing a seal of the AAI valve allowing the fluid volume to flow from the cylinder of the penile prosthetic device transversely through the pump body to the reservoir.

22. The method of claim 21, further comprising:

transferring the fluid volume from a pump bulb axially through the pump body to the cylinder of the penile prosthetic device; and

displacing a crown gasket of the AAI valve allowing the fluid volume to flow from the pump bulb to the cylinder, bypassing the drain flow path.

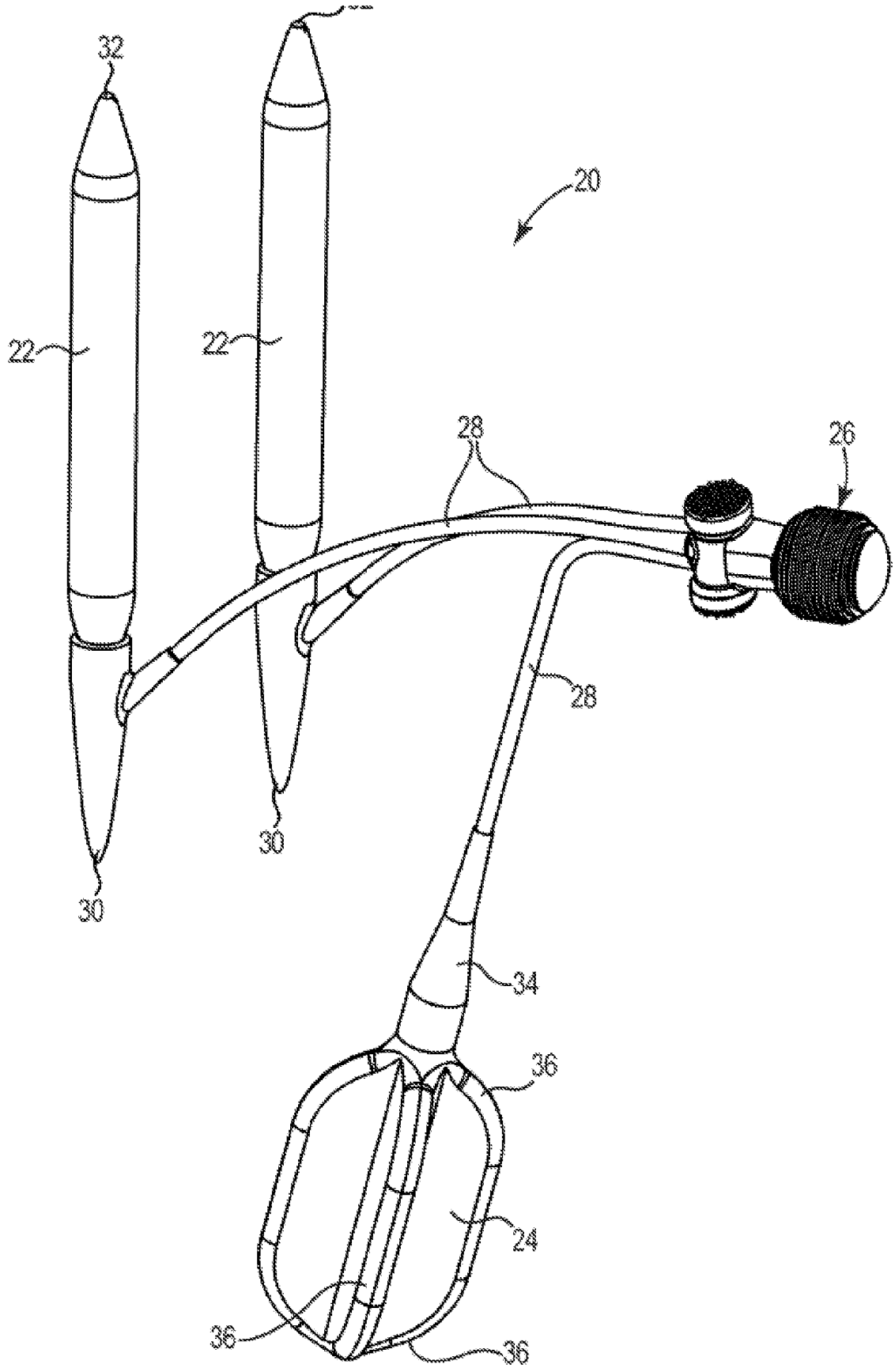

Fig. 1

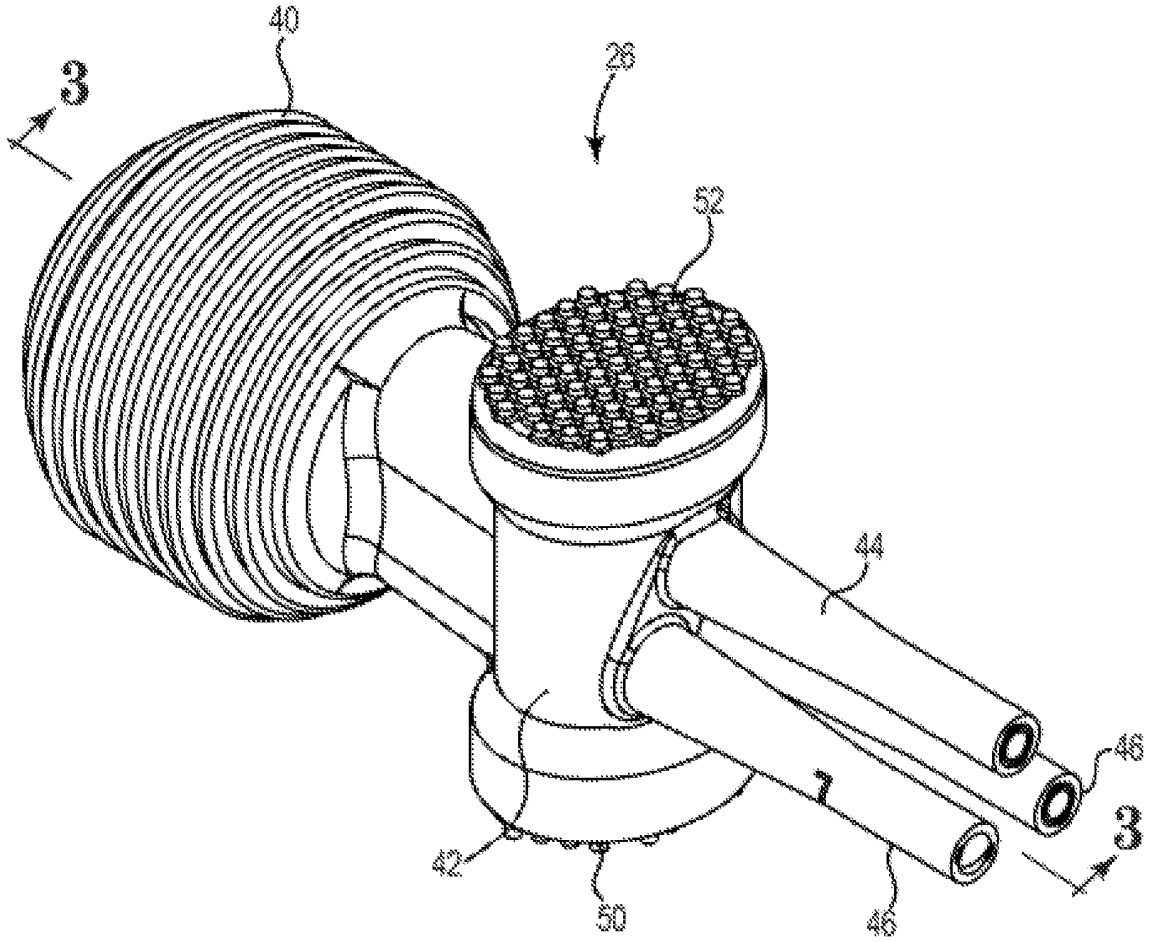

Fig. 2

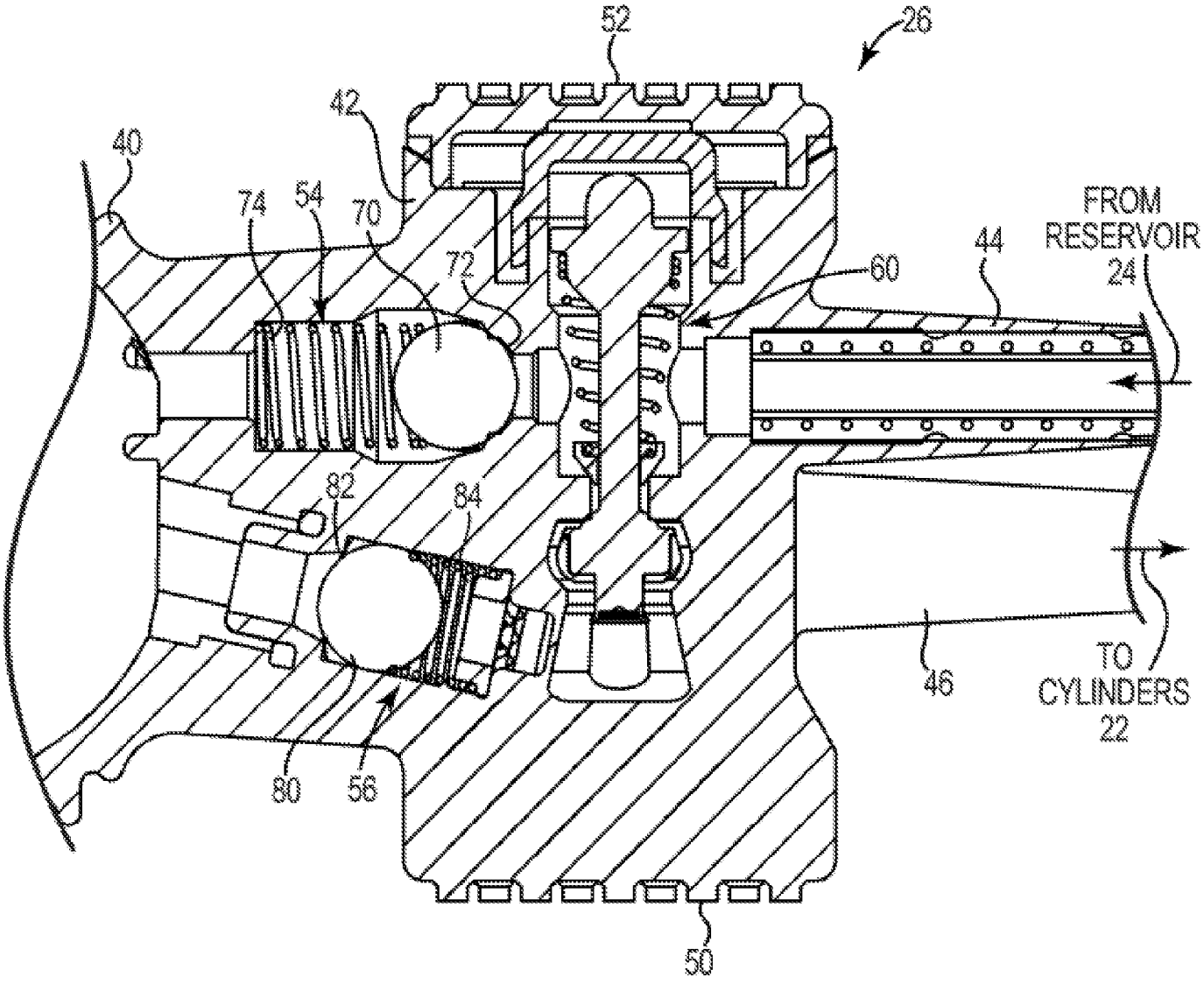
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Fig. 3

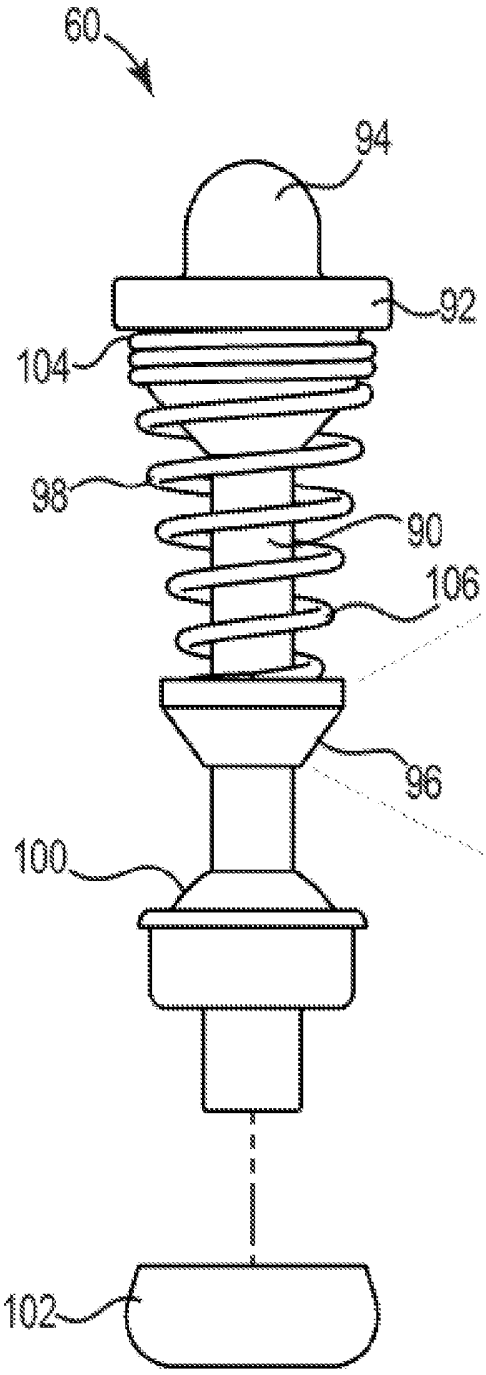

Fig. 4A

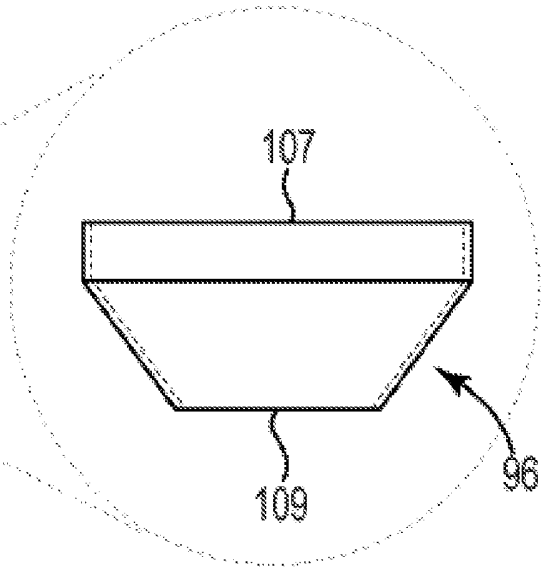

Fig. 4B

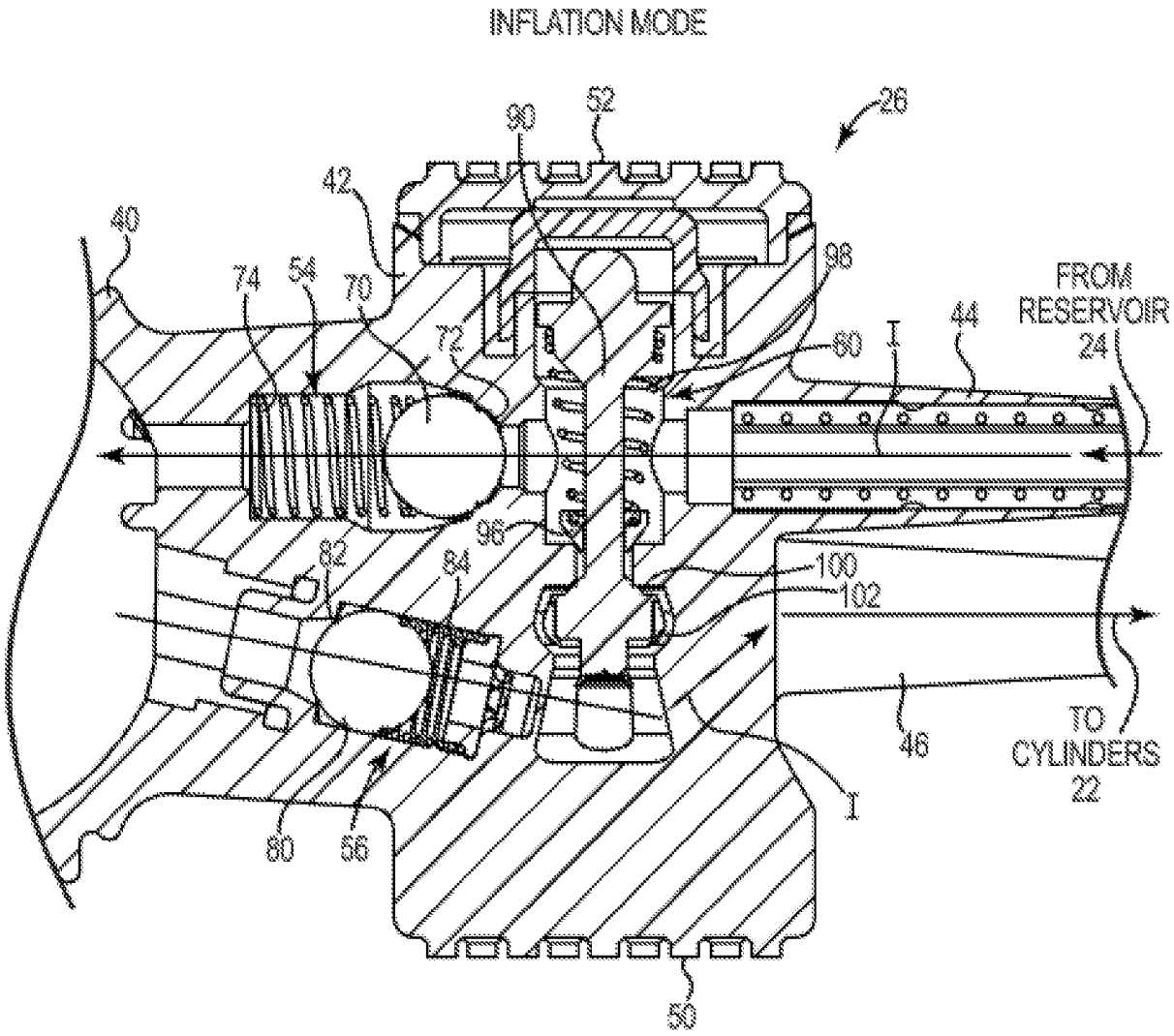
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Fig. 5

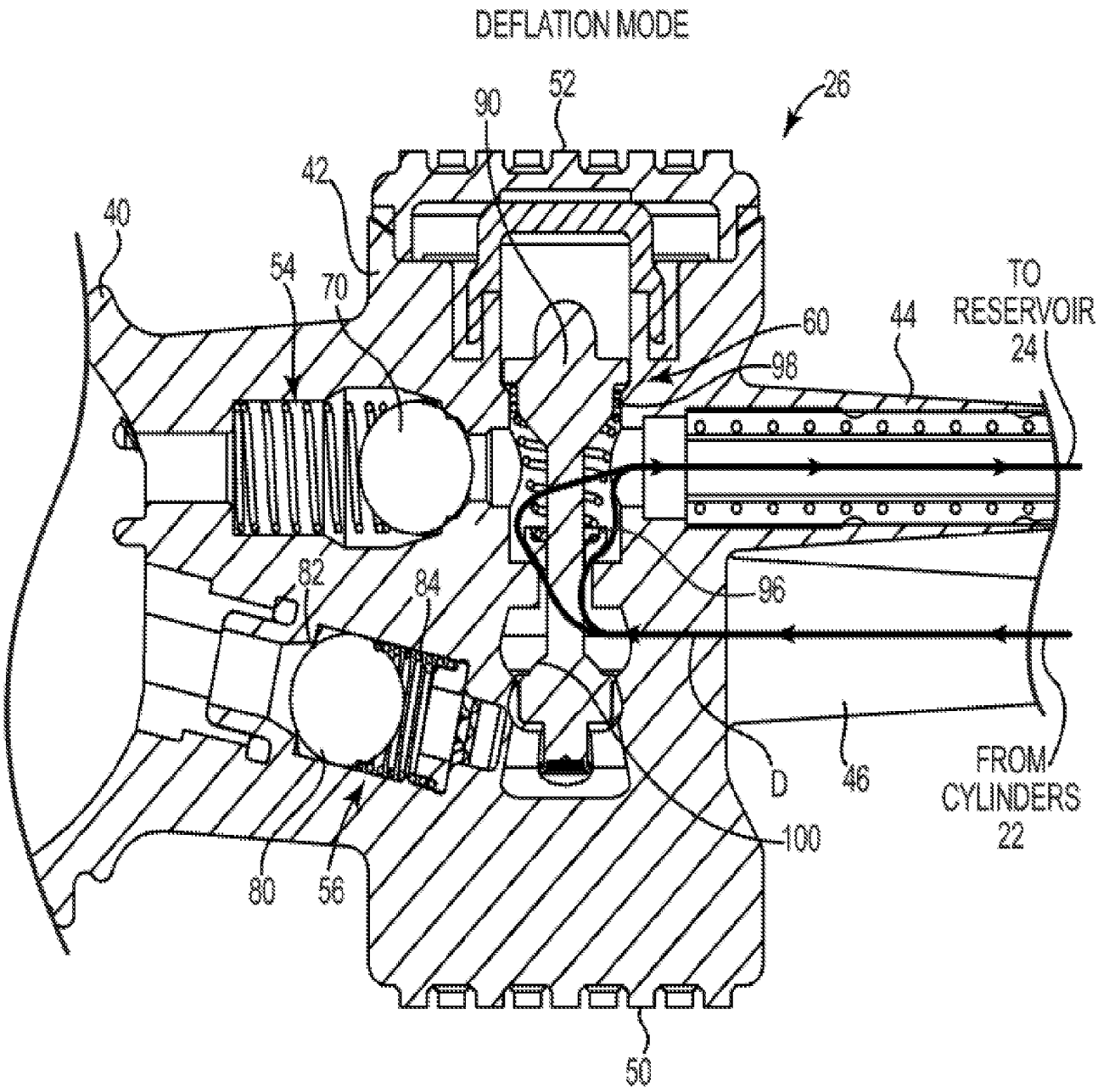
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Fig. 6

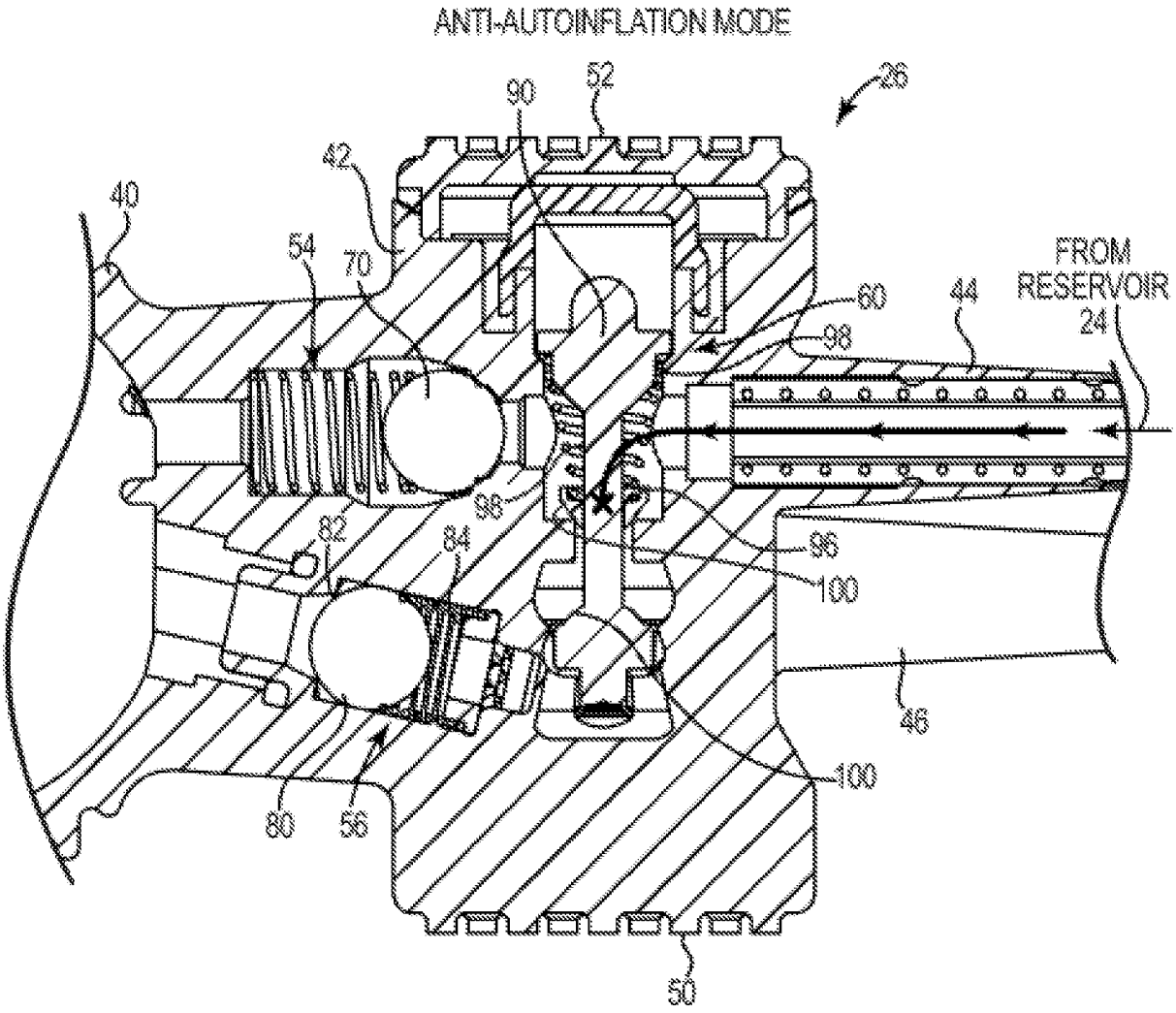
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Fig. 7

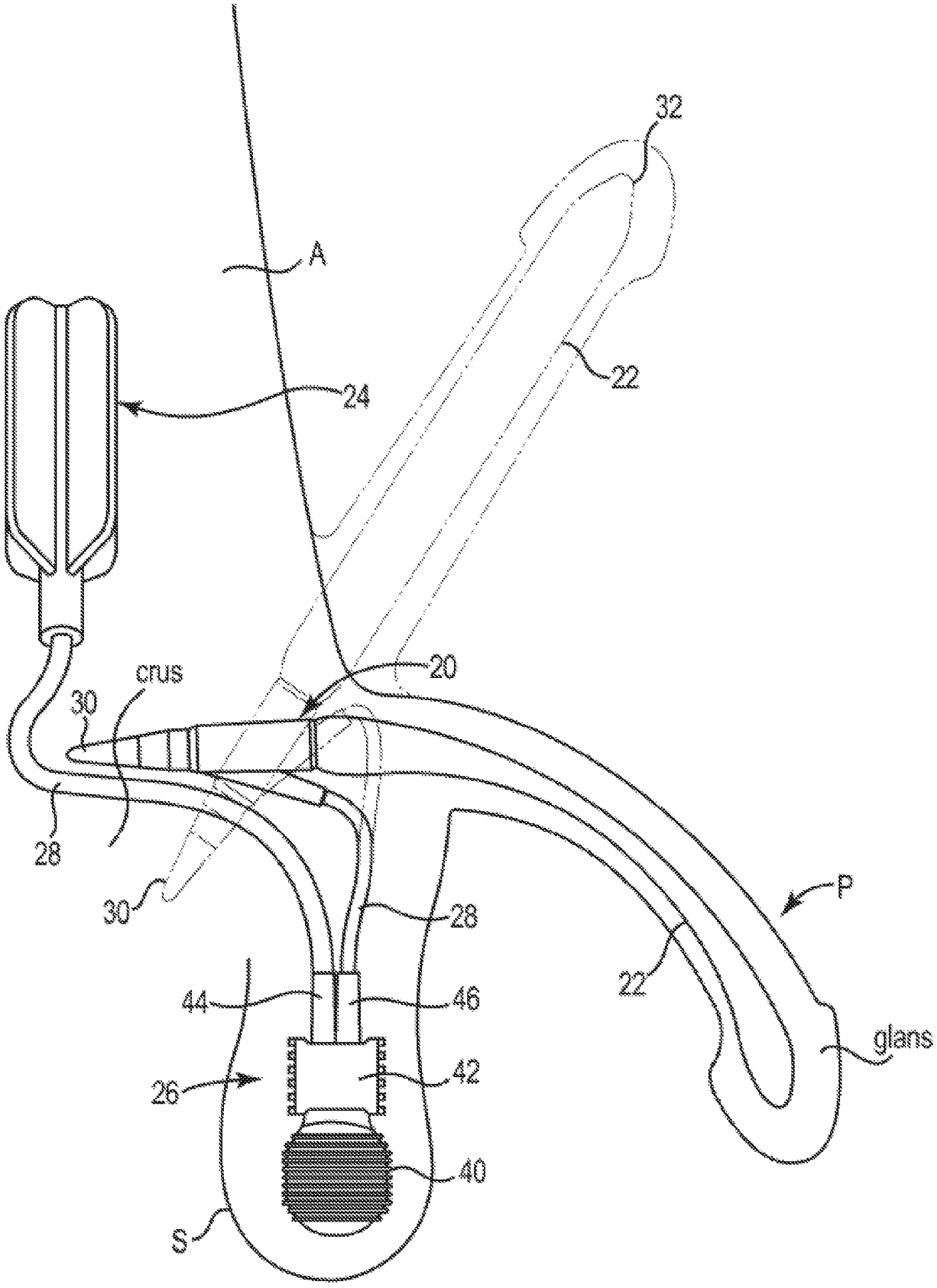

Fig. 8