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(54) Title: FOLD FLAT STOW IN FLOOR SEAT ASSEMBLY WITH COLLAPSIBLE BOLSTERS

(57) Abrégé/Abstract:
A seat assembly for use in an automotive vehicle comprising a seat cushion and a seat back pivotally coupled to the seat cushion for movement between a generally upright seating position and a fold flat position resting against the seat cushion. A side bolster panel is pivotally coupled to lateral opposing sides of each of the seat cushion and seat back and operable between a flexed position facing toward the center of the seat cushion and the seat back and a relaxed position aligned generally flush with the seat cushion and the seat back. A cam mechanism is operatively coupled to the each side bolster panel for automatically releasing the side bolster panels from the flexed position to the relaxed position in response to pivotal movement of the seat back from the seating position to the fold flat position to provide a low profile folded seat assembly.

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(54) Title: FOLD FLAT STOW IN FLOOR SEAT ASSEMBLY WITH COLLAPSIBLE BOLSTERS

(57) Abstract: A seat assembly for use in an automotive vehicle comprising a seat cushion and a seat back pivotally coupled to the seat cushion for movement between a generally upright seating position and a fold flat position resting against the seat cushion. A side bolster panel is pivotally coupled to lateral opposing sides of each of the seat cushion and seat back and operable between a flexed position facing toward the center of the seat cushion and the seat back and a relaxed position aligned generally flush with the seat cushion and the seat back. A cam mechanism is operatively coupled to the each side bolster panel for automatically releasing the side bolster panels from the flexed position to the relaxed position in response to pivotal movement of the seat back from the seating position to the fold flat position to provide a low profile folded seat assembly.

FOLD FLAT STOW IN FLOOR SEAT ASSEMBLY WITH COLLAPSIBLE BOLSTERS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The subject invention relates to a seat assembly which is folded and stowed within the floor of a vehicle, and more particularly, to a seat assembly having automatically collapsible bolsters and a stowable headrest.

2. Description of the Related Art

Seat assemblies within an automotive vehicle include a seat cushion and a seat back, often pivotally coupled to the seat cushion. It is commonly known to provide a seat assembly wherein the seat back is pivotal from an upright seating position for supporting an occupant in the seat to a folded flat position against the seat cushion for stowage. It is also known to provide a tumble seat assembly wherein the seat cushion pivots about the floor of the vehicle with the seat back in the folded flat position to provide addition cargo storage within the compartment of the vehicle.

The seat cushion and seat back of an automotive seat assembly typically comprise a frame assembly for supporting a contoured cellular foam pad encased by a trim cover. The seat cushion and seat back often include side bolsters provided by thick side areas of the foam pad or mechanical mechanisms such as inflatable air bladders for providing the occupant with side or lateral support when seated in the seat assembly. However, these side bolsters create a thick seat profile and complicate the ability of the seat back to be pivoted to the fold flat position relative to the seat cushion.

Therefore, it is desirable to provide a seat assembly having side bolsters in either or both of the seat back and seat cushion which maintain a thin seat profile in both the folded flat position and the tumbled position for stowage within a bin in the floor of the vehicle.

SUMMARY OF THE INVENTION

According to one aspect of the invention there is provided a seat assembly for use in an automotive vehicle comprising a seat cushion and a seat back pivotally coupled to the seat cushion for movement between a generally upright seating position and a fold flat position resting against the seat cushion. A side bolster panel is pivotally coupled to lateral opposing sides of at least one of the seat cushion and seat back and operable between a flexed position facing toward the center of the seat cushion and the seat back and a relaxed position generally flush with the seat cushion and the seat back. A cam mechanism is operatively coupled to the side bolster panel for automatically releasing the side bolster panel from the flexed position to the relaxed position in response to pivotal movement of the seat back from the seating position to the fold flat position to provide a low profile folded seat assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

Advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Figure 1 is a perspective view of the seat assembly according to the subject invention in a seating position;

Figure 2 is a perspective view of the seat assembly in a fold flat position;

Figure 3 is a perspective view of the seat assembly in a tumbled position;

Figure 4 is a perspective view of the seat assembly in the tumbled position and a bin in the vehicle floor with the cover in the open position;

Figure 5 is a perspective view of the seat assembly in a stowed position within the bin and the cover in the closed position;

Figure 6 is a side sectional view of the seat assembly in the stowed position;

Figure 7 is a perspective view of the seat back showing a pivotal side bolster and cam mechanism;

Figure 8 is a perspective view of the seat cushion showing a pivotal side bolster and a cam mechanism;

Figure 9 is a side view of a cam mechanism for actuating the side bolster of the seat

cushion; and

Figure 10 is a perspective view of a headrest assembly pivotally coupled to the seat back.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the Figures, a seat assembly for use in an automotive vehicle is generally shown at 10 in Figure 1. The seat assembly 10 includes a seat cushion 12 and a seat back 14 pivotally coupled to the seat cushion 12 by a recliner mechanism 16. The recliner mechanism 16 provides selective pivotal adjustment of the seat back 14 relative to the seat cushion 12 between a plurality of reclined seating positions for supporting an occupant within the seat, as shown in Figure 1, and a fold flat position pivoted forwardly against the seat cushion 12, as shown in Figure 2.

The seat assembly 10 further includes a pair of front risers 18 having a first end 20 pivotally coupled to each respective side adjacent the distal end of the seat cushion 12 and a second opposite end 22 pivotally coupled to a planar floor 24 of the vehicle. A pair of rear risers 26 similarly have a first end 28 pivotally coupled to the respective sides of the seat cushion 12 adjacent the seat back 14 and a second opposite end 30 releasably connected to the vehicle floor 24. The front and rear risers 18, 26 support the seat assembly 10 above the vehicle floor 24. The front risers 18 provide rotational movement of the seat assembly 10 between the seating position and fold flat position, shown in Figures 1 and 2, and a tumbled position with the seat assembly 10 rotated into a storage bin 32 recessed beneath the floor 24 of the vehicle, as shown in Figures 5 and 6.

The storage bin 32 is covered by a lid 34 pivotally connected to the floor 24 for movement between an open position providing access to the bin 32, as shown in Figure 4, and a closed position covering access to the bin 32, as shown in Figures 1, 2, 5 and 6. The lid 34 may include one or more rigid panels 36 pivotally hinged together for providing access to various sections of the bin 32 as desired.

The seat assembly 10 also includes an armrest 38 pivotally connected to each lateral side of the seat back 14 for pivotal movement between an extended use position generally parallel with the seat cushion 12, as shown in Figure 1, and a retracted position aligned flush with the side of the seat back 14, as shown in Figure 2.

A headrest assembly 40 is operatively coupled to the upper distal end of the seat back 14 and pivotal between a generally upright use position elevated vertically above the seat back 14 for supporting the seat occupant's head, as shown in Figure 1, and a stowed positioned pivoted rearwardly and recessed within a cavity 42 formed in the back panel of the seat back 14, as shown in Figure 2.

Referring to Figure 7, the seat back 14 includes a rigid seat back frame 44 for supporting a contoured cellular foam pad 46 encased in a trim cover 48, such as cloth, leather or vinyl. A semi-rigid side bolster panel 50 is hingedly connected to each opposite lateral side of the rigid frame 44. Each bolster panel 50 is pivotal about its longitudinal axis between a flexed position pivoted inwardly toward the center of the seat back 14 and a relaxed position spread laterally flat and generally flush with the seat back 14. The bolster panels 50 are bias by a spring, or the like, to the relaxed position.

A cam mechanism 52 is also pivotally coupled to each lateral side of the rigid frame 44 behind each bolster panel 50 and generally midway between the opposite ends of the panel 50. The cam mechanism 52 includes a post 54 pivotally connected to the side of the frame 44 and projecting laterally therefrom and a cam lobe 56 extending from the post 54 for engagement with the side bolster panel 50. The armrest 38 is fixedly secured to the post 54 for pivoting the cam lobe 56 between an actuated position pressing the side bolster panel 50 to the flexed position with the armrest 38 in the extended use position and a released position disengaged from the side bolster panel 50 allowing it to return to the relaxed position when the armrest 38 is pivoted to the retracted position.

Referring to Figure 8, the seat cushion 12 similarly includes a rigid seat cushion frame 58 for supporting a contoured cellular foam pad 60 encased in a trim cover 62, such as cloth, leather or vinyl. A semi-rigid side bolster panel 64 is hingedly connected to each opposite lateral side of the rigid frame 58. Each bolster panel 64 is pivotal about its longitudinal axis between a flexed position pivoted inwardly toward the center of the seat cushion 12 and a relaxed position spread laterally flat and generally flush with the seat cushion 12. The bolster panels 64 are bias by a spring, or the like, to the relaxed position.

A cam mechanism 66 is also pivotally coupled to each lateral side of the rigid frame 58 behind each bolster panel 64 and generally midway between the opposite ends of the panel 64. The cam mechanism 66 includes a post 68 pivotally connected to the side of the

frame 58 and projecting laterally therefrom and a cam lobe 70 extending from the post 68 for engagement with the side bolster panel 64. Referring to Figure 9, a push-pull cable 72 is connected between a lever 74 projecting from the cam post 68 and the recliner mechanism 16 on the seat back 14. An arcuate cable guide 76 winds the cable 72 about the recliner 16. When the seat assembly 10 is in the seating position, the cam lobe 70 is pressed against the bolster panel 64 for maintaining the bolster panel in the flexed position. When the seat assembly is rotate from the seating position to the fold flat position, the cable 72 winds about the cable guide 76 and pulls the lever 74 to rotate the cam lobe 70 and disengage the cam lobe 70 from contact with the bolster panel 64, thus allowing the bolster panel 64 to pivot to the relaxed position.

It should be appreciated that a cable mechanism and arrangement similar to that shown in Figure 8 for the seat cushion 12 may be attached between the recliner mechanism 16 and the post 54 of cam mechanism 52 to rotate the cam lobe 56 and disengage the cam lobe 56 from contact with the bolster panel 50 to allow the bolster panel 50 to automatically pivot to the relaxed position in response to pivotal movement of the seat back 14 between the upright seating position to the fold flat position.

Referring to Figure 10, the headrest assembly 40 further includes a pair of guide posts 78 supporting a foam pad 80 above the seat back 14 in the upright use position. The guide posts 78 are pivotally coupled to a tube 82 rotatably journaled to the top of the seat back frame 44 by a bearing sleeve 84. A coil spring 86 is connected between the seat back frame 44 and the rotatable tube 82 for biasing the headrest 40 to the stowed position. A disc recliner clutch 88 is supported by the seat back frame 44 and operatively coupled to the tube 82 for release the headrest 40 for pivotal movement from the upright use position to the stowed position. A cable 90 is connected between the disc recliner clutch 88 and the recliner mechanism 16. When the seat back 14 is pivoted from the upright seating position to the fold flat position, the cable 90 pulls and releases the disc recliner clutch 88 whereby the spring 86 automatically pivots the headrest 40 from the upright use position to the stowed positioned recessed within the cavity 42 in the back of the seat back 14. When the seat back 14 is returned from the fold flat position to the upright seating position, the headrest 40 may be pivoted to the use position and the cable 90 releases the disc recliner clutch 88 to relock the headrest 40 in the use position.

In operation, to fold and tumble the seat assembly 10 to a stored position recessed within the storage bin 32 beneath the floor 24, the seat back 14 is pivoted from the upright seating position to the fold flat position. The cam mechanisms 52, 66 simultaneously release the cam lobes 56 from the actuated positions to the released position to allow the bolster panels 50, 64 of each of the seat back 14 and seat cushion 12, respectively, to be bias to the relaxed position. The seat back 14 is thus folded relatively flat against the seat cushion 12 to provide a low profile seat assembly 10. Also, when the seat back 14 is pivoted to the fold flat position, the headrest 40 is also automatically rotated from the upright use position to the stowed position recessed within the cavity 42. The cover 34 may then be pivoted to the open position providing access to the storage bin 32. The seat assembly 10 is pivoted about the front risers 18 from the fold flat position to the tumbled position and then further about the second pivotal ends 22 of the front risers 18 into the storage bin 32 in an upside down configuration completely recessed within the storage bin 32. The cover 34 is then pivoted to the closed position covering the bin 32 and seat assembly 10 and providing a flat load floor 24 within the vehicle.

The invention has been described in an illustrative manner, and it is to be understood that the terminology, which has been used, is intended to be in the nature of words of description rather than of limitation.

Many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practised other than as specifically described.

What is claimed is:

1. A seat assembly for use in an automotive vehicle comprising:

a seat cushion;

a seat back pivotally coupled to said seat cushion for movement between a generally upright seating position and a fold flat position resting against said seat cushion;

a side bolster panel pivotally coupled to lateral opposing sides of at least one of said seat cushion and seat back and operable between a flexed position facing toward the center of said seat cushion and said seat back and a relaxed position generally flush with said seat cushion and said seat back; and

a cam mechanism operatively coupled to said side bolster panel for automatically releasing said side bolster panel from said flexed position to said relaxed position in response to pivotal movement of said seat back from said seating position to said fold flat position to provide a low profile folded seat assembly.

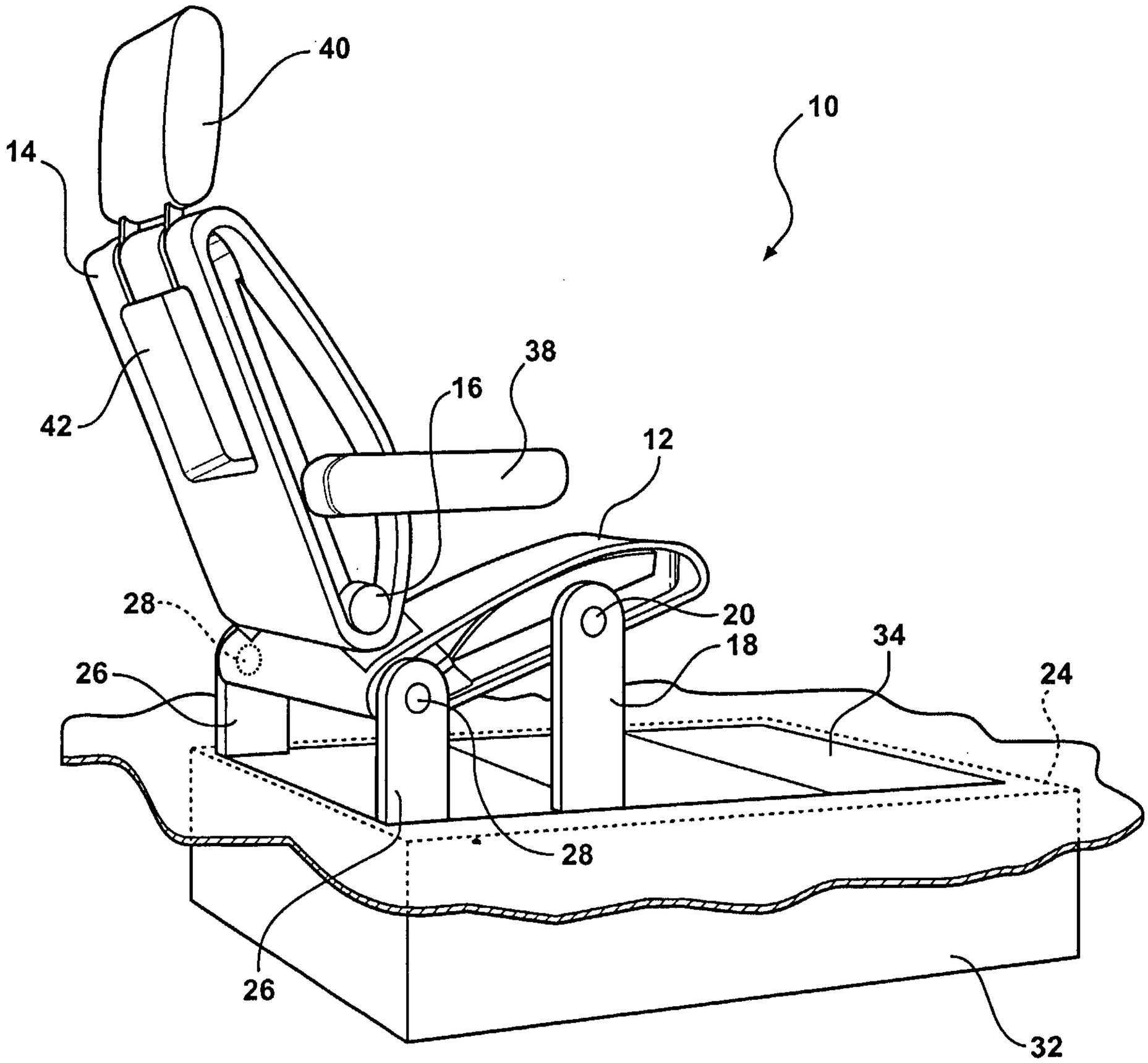
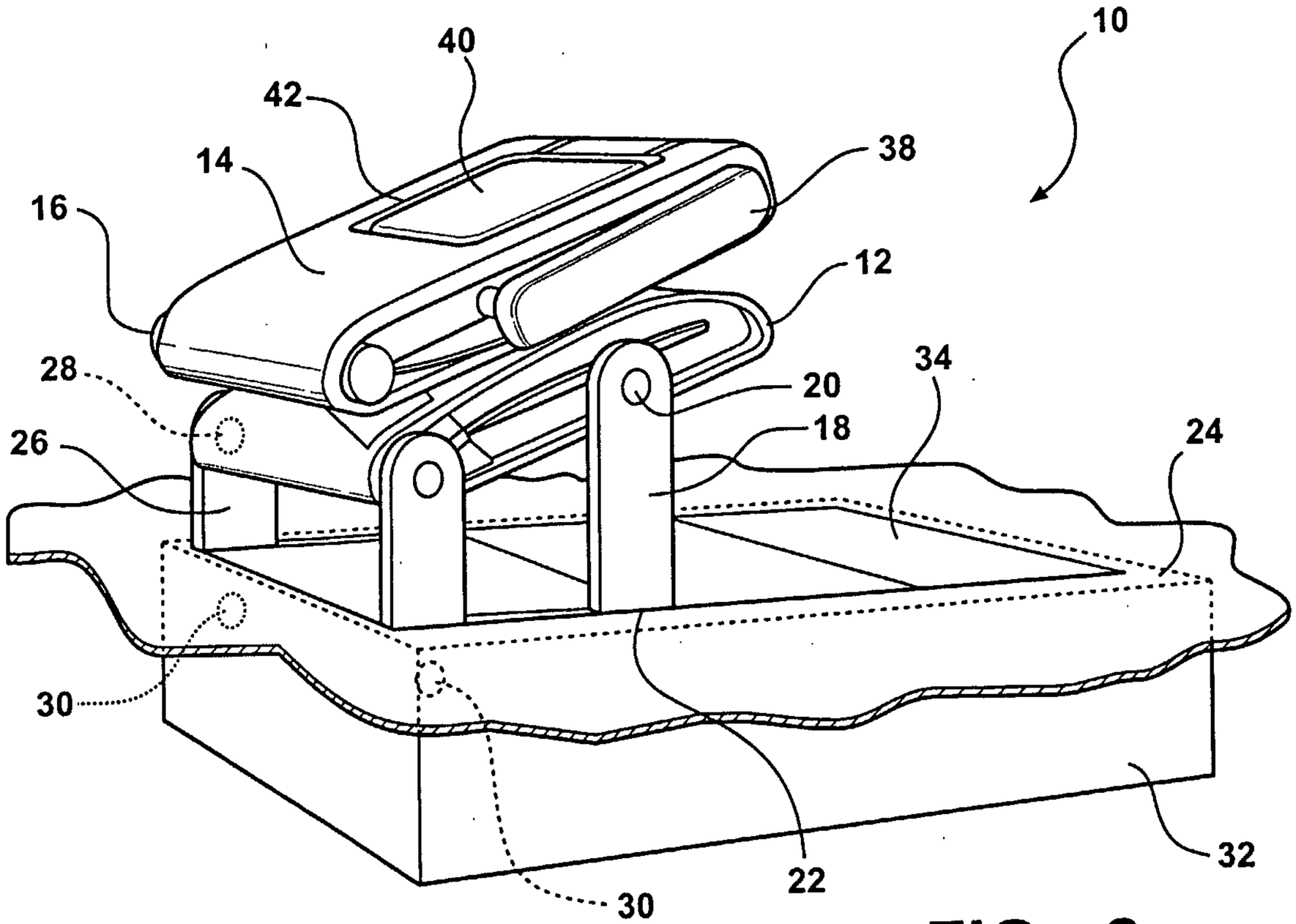


FIG - 1


10
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42
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FIG - 2

12
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FIG - 3

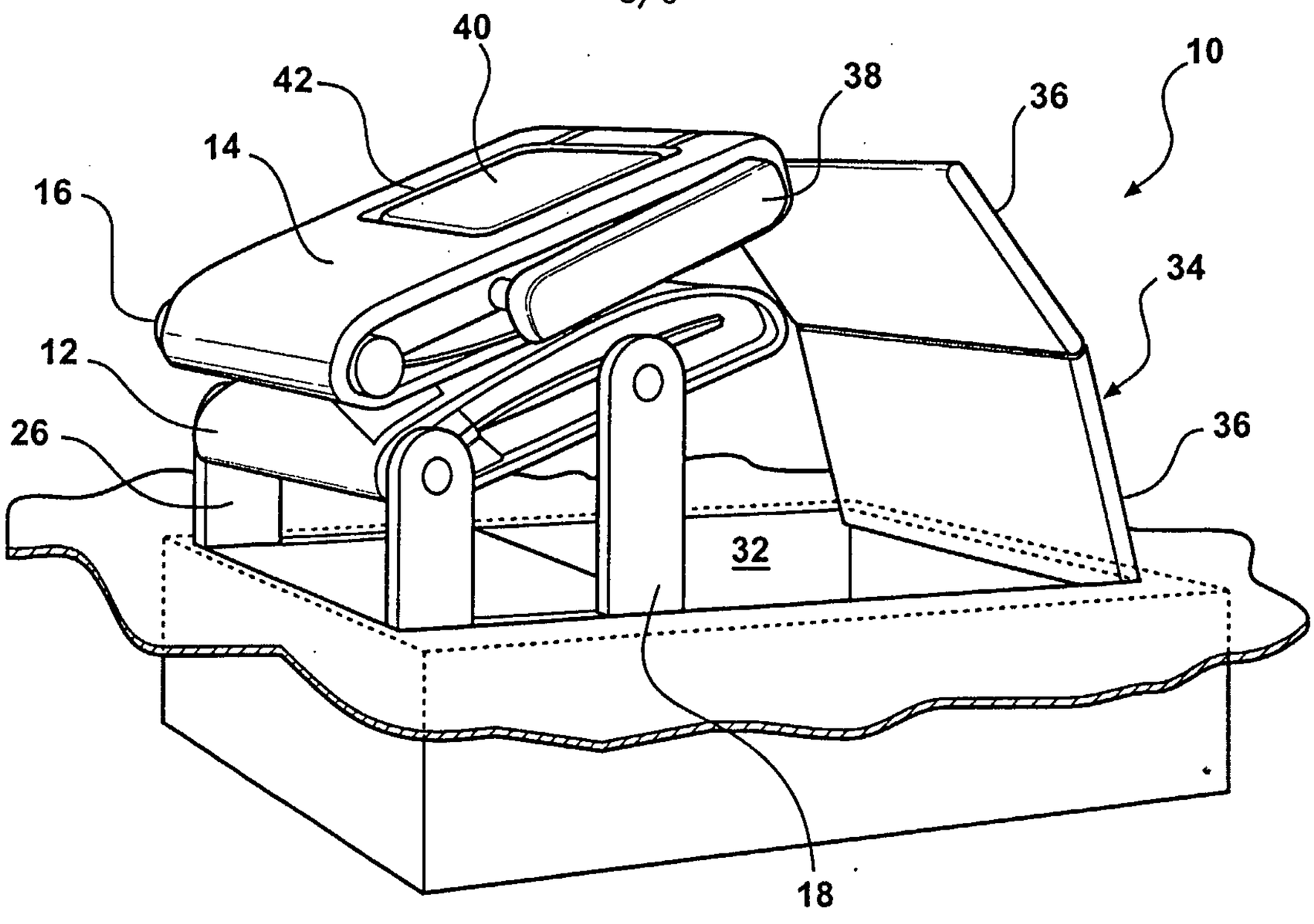

FIG - 4

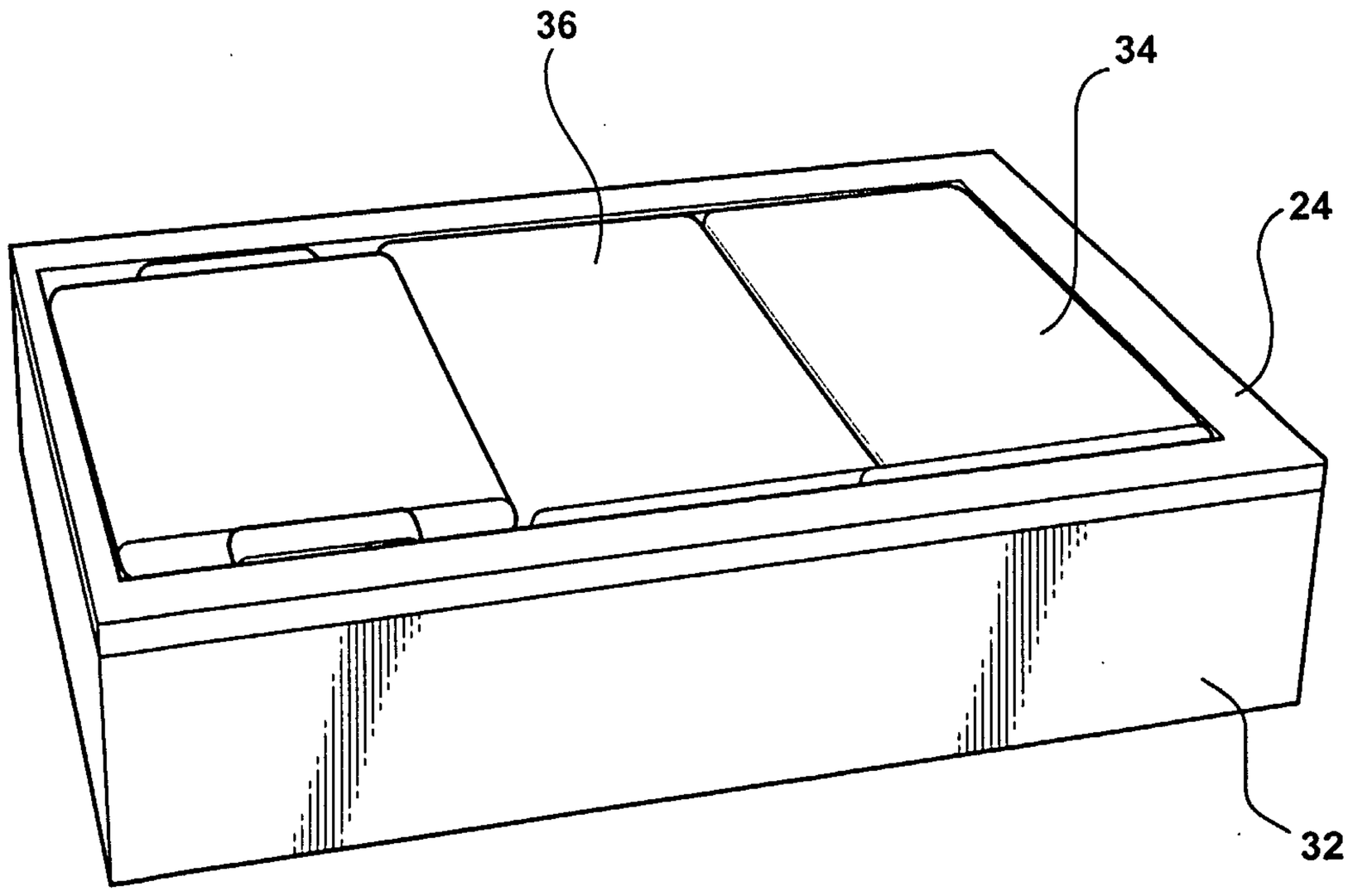

FIG - 5

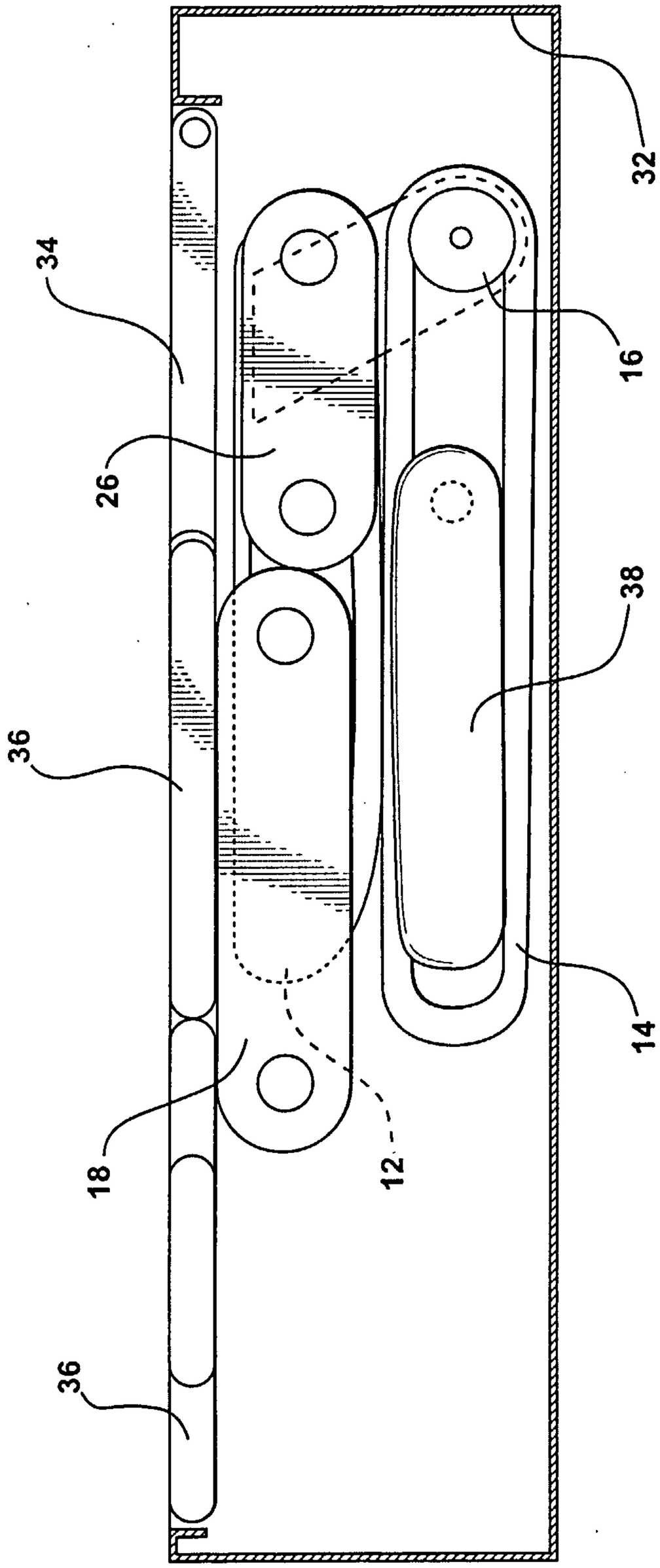

FIG - 6

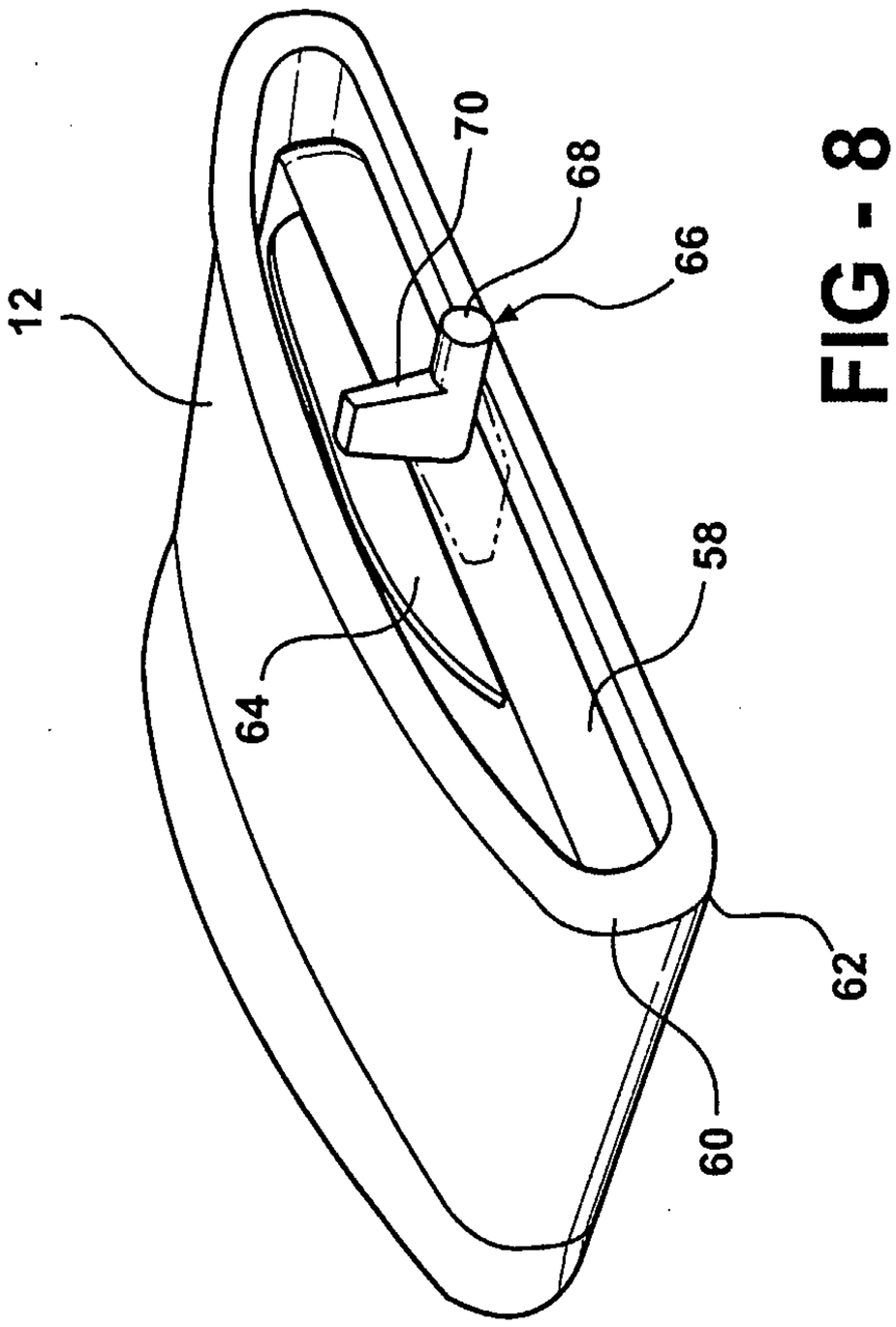

FIG - 8

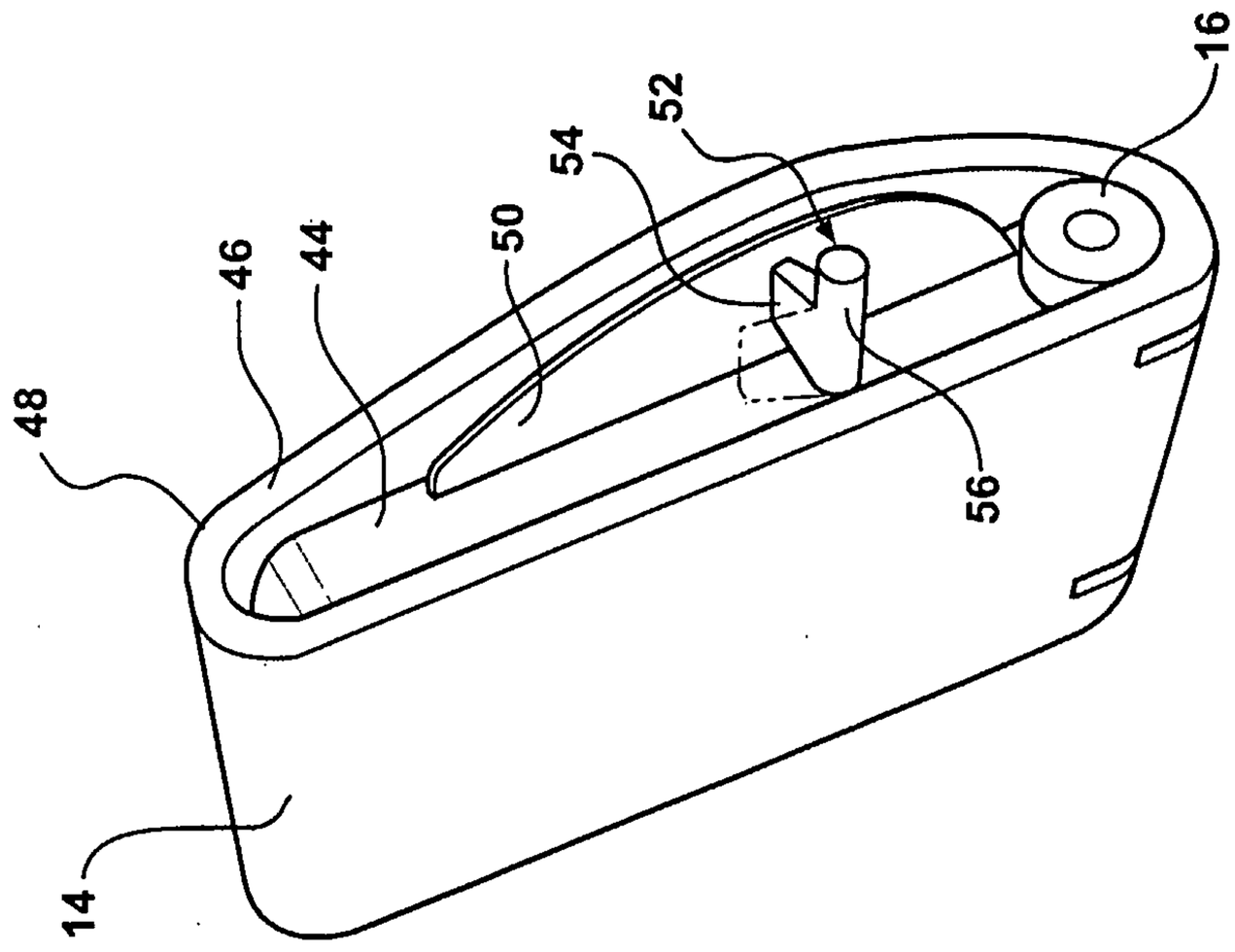

FIG - 7

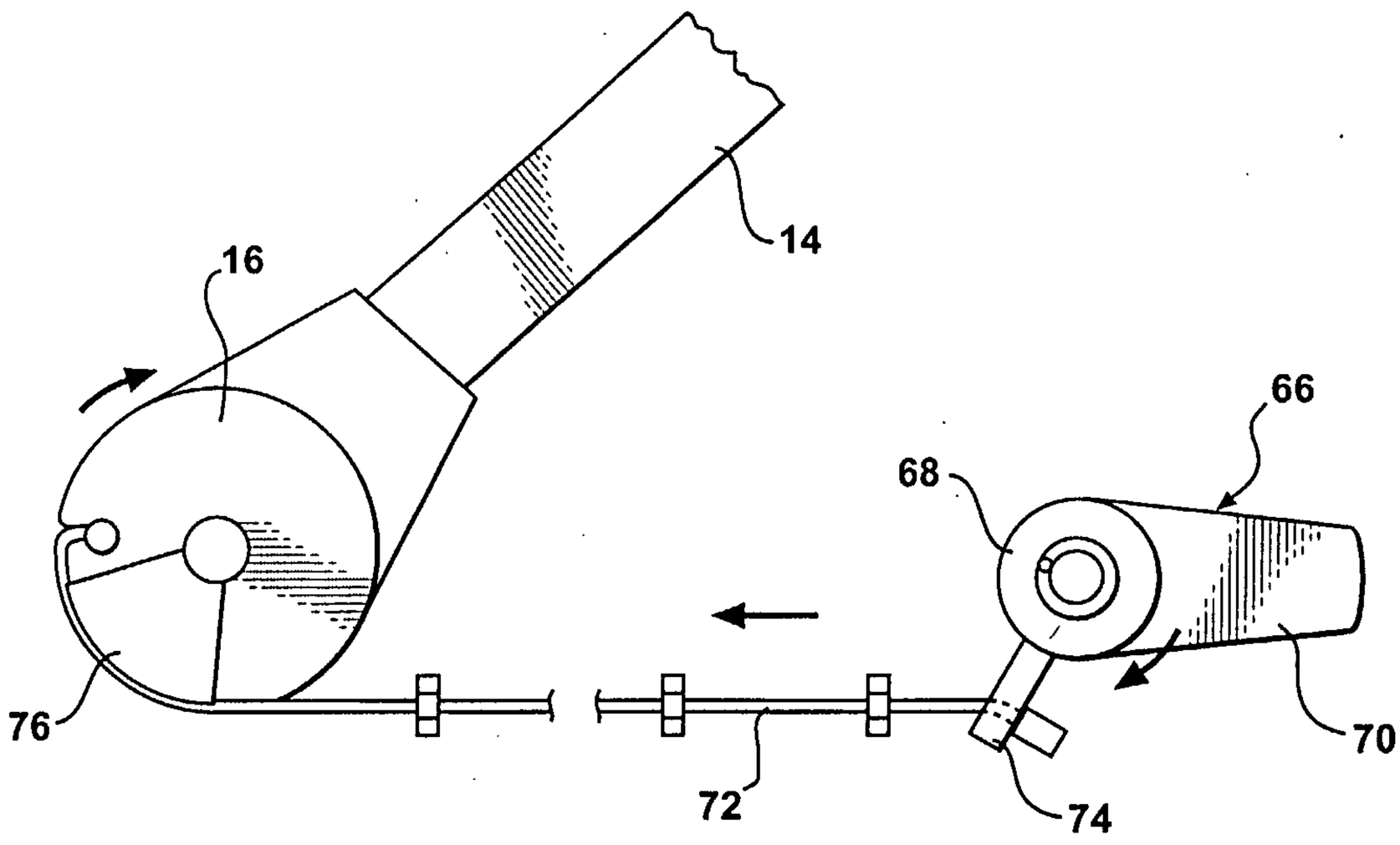

FIG - 9

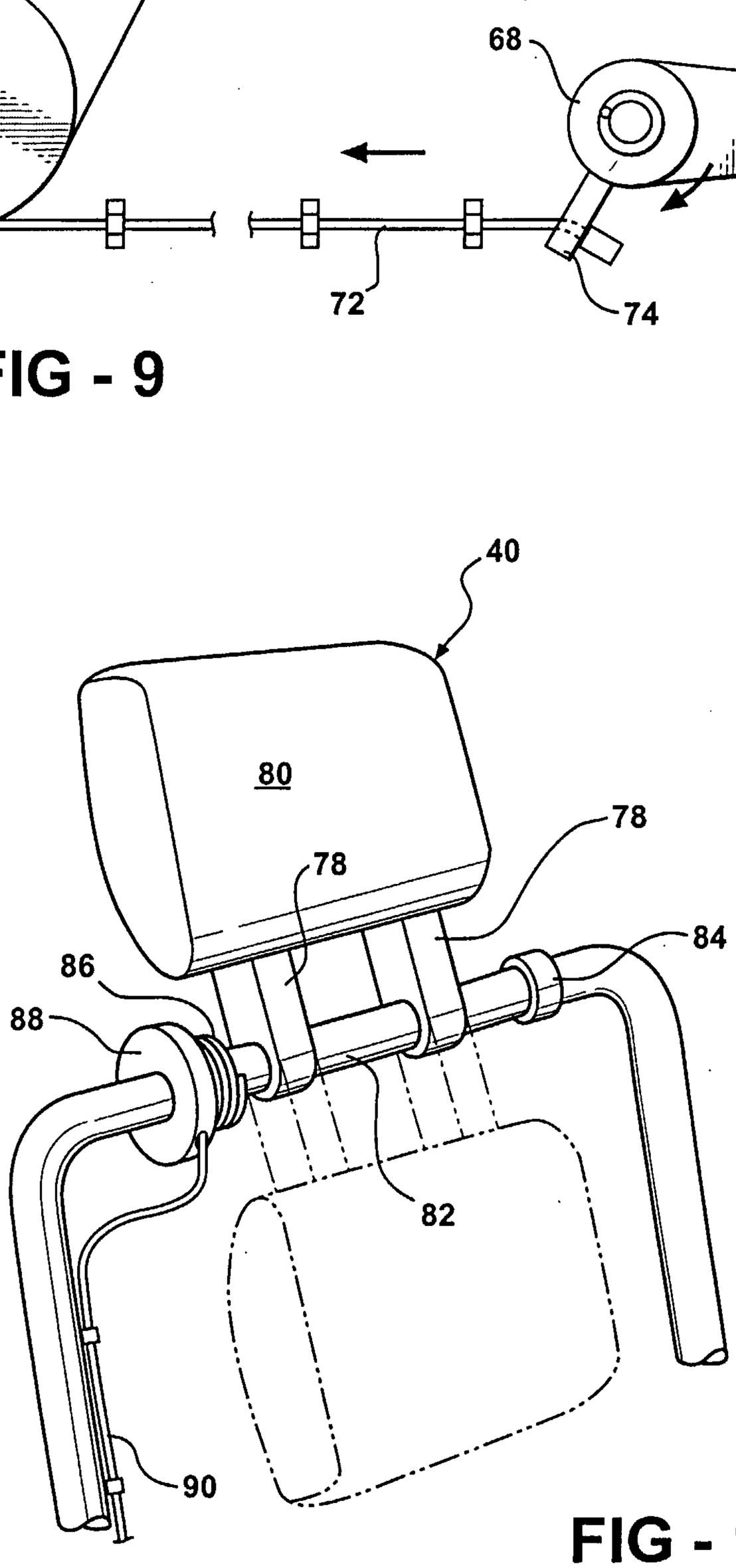

FIG - 10