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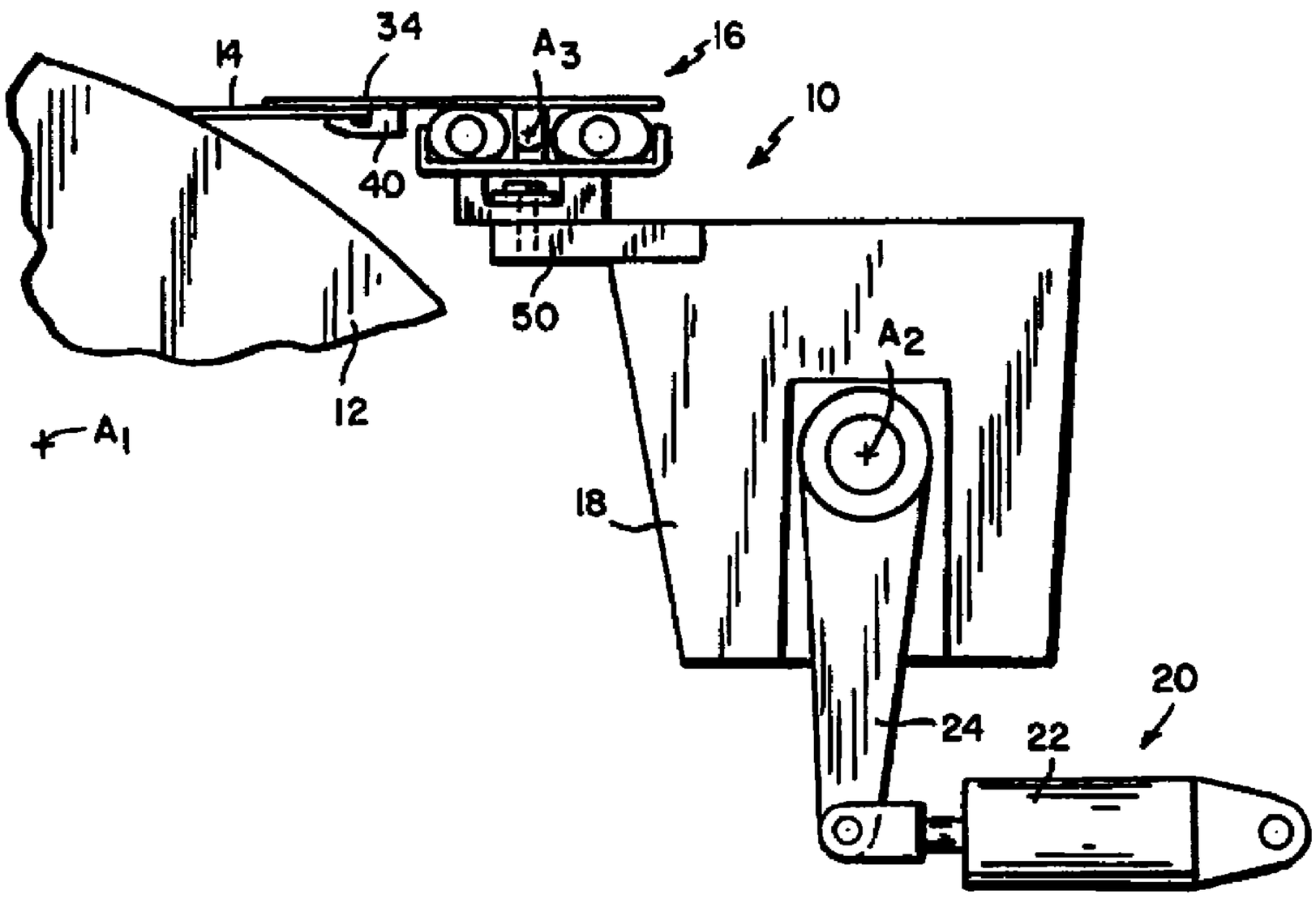
(54) **PORTE-RACLE AMOVIBLE**

(54) **REMOVABLE DOCTOR BLADE HOLDER**



(57) La présente invention concerne un appareil de raclage (10) destiné à un rouleau (12) de machine à papier comprenant une racle (14), un porte-racle (16) permettant d'appliquer la racle sur la surface du rouleau, et une face arrière de racle (18) permettant de soutenir le porte-racle. Le porte-racle est fixé de manière libérable sur la face arrière de la racle, ce qui permet de le démonter pour être nettoyé ou réparé à l'extérieur de la machine à papier.

(57) A doctoring apparatus (10) for a roll (12) in a papermachine includes a doctor blade (14), a blade holder (16) for applying the doctor blade to the surface of the roll, and a doctor back (18) for supporting the blade holder. The blade holder is releasably secured to and removable from the doctor back for cleaning and repair outside of the papermachine.

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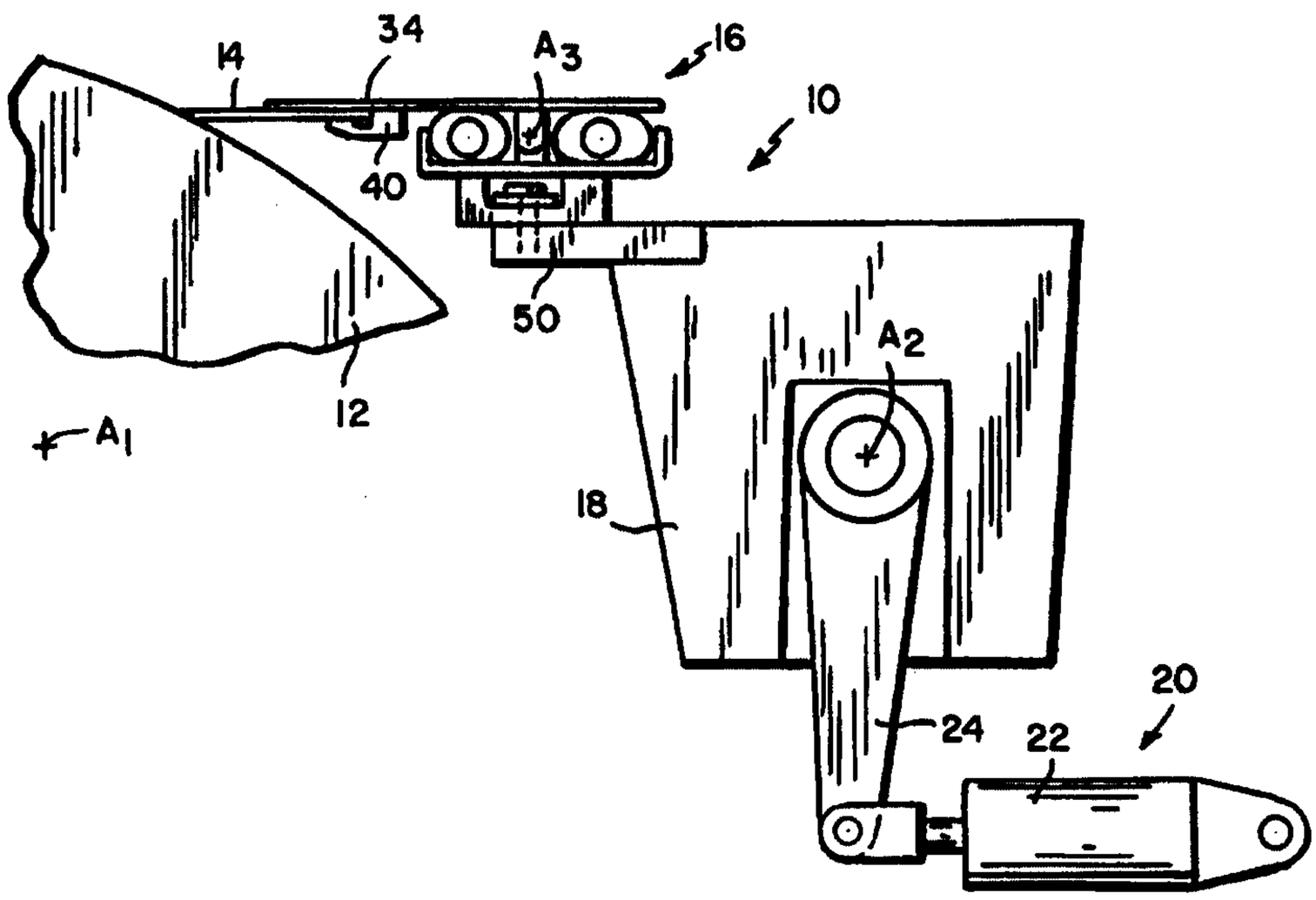


(57) Abstract

A doctoring apparatus (10) for a roll (12) in a papermachine includes a doctor blade (14), a blade holder (16) for applying the doctor blade to the surface of the roll, and a doctor back (18) for supporting the blade holder. The blade holder is releasably secured to and removable from the doctor back for cleaning and repair outside of the papermachine.

REMOVABLE DOCTOR BLADE HOLDER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to doctors used in papermaking machines, and is concerned in particular with the provision of a blade holder which is readily separable from the doctor back and removable from the papermaking machine for cleaning, inspection and repair.

2. Description of the Prior Art

The main components of a doctor system include the doctor blade, the blade holder, the doctor back and the loading mechanism. The doctor blade keeps the roll clean and/or sheds the sheet. It must be perfectly flat, straight and parallel, and its composition must be compatible with the roll to be doctored.

The blade holder exerts a uniform, designated load pressure on the blade. It holds the blade firmly against the roll, accommodates roll irregularities and, within limits, compensates for thermal expansion.

The doctor back is in essence the backbone of the doctor. It serves as the support structure for the blade holder. The loading mechanism pivots the doctor back to load the doctor blade against the roll.

Doctor blade holder designs used in recent years are more complex and have more components than the simpler blade holders used in the past. As a result, the more recent holder designs require more routine cleaning and maintenance. The doctor blade holders are normally mounted to the doctor back rigidly with a series of fasteners. Maintenance and cleaning of the blade holder can take place while the doctor remains in the machine but only in installations where the holder is accessible. However, in many cases, papermachine framework or other equipment prevents access to the blade holder while it is in the papermachine. In these cases, the complete doctor structure including the doctor back and attached holder must be removed from the papermachine to perform any cleaning or maintenance work. This task involves removing heavy equipment which requires extensive manpower and machine downtime. After making the necessary repairs, the entire doctor assembly must be re-installed in the papermachine, consuming more valuable manpower and time. In addition to the re-installation, the doctor must be re-

aligned to the roll surface for optimum doctor performance.

In EP-A-0294992 we described a previous design of doctoring apparatus which typifies the aforementioned prior art.

SUMMARY OF THE INVENTION

As is known from EP-A-0294992, the present invention relates to apparatus for doctoring a roll rotatably mounted in a papermachine for rotation about an axis extending in a cross-machine direction, said apparatus comprising a doctor blade, a blade holder for applying said doctor blade to the surface of said roll, and a doctor back for supporting the blade holder, said blade holder including: a support tray and support means for supporting said doctor blade on said support tray for pivotal movement about another axis parallel to the rotational axis of said roll.

In contrast to EP-A-0294992 and in accordance with the invention, the support tray and the support means are components of an integral assembly provided with mounting means for removably mounting said integral assembly on said doctor back in an operative position adjacent said roll and extending in said cross-machine direction; and with locking means for releasably securing said integral assembly in said operative position, said locking means being accessible and operable from a side of said papermachine.

As appears hereinafter various embodiments of the invention are described each of which avoids or at least significantly minimizes the above mentioned problems by providing a doctor blade holder which is readily separable from the supporting doctor back. Thus, while the doctor back remains undisturbed in the

papermachine, operating personnel can remove the blade holder for cleaning and maintenance. Thereafter, the blade holder is returned to its operative position on the doctor back and locked in place.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objectives, features and advantages of the present invention will be described in greater detail with reference to the accompanying drawings; wherein:

Figure 1 is a side view of a doctor assembly in accordance with the present invention;

Figure 2 is an enlarged view of the doctor blade holder shown in Figure 1;

Figure 3A is a sectional view taken along line 3A-3A of Figure 2 showing the blade holder in its operative position clamped to the doctor back;

Figure 3B is a view similar to Figure 3A showing the blade holder unclamped from the doctor back;

Figure 3C is a horizontal sectional view taken along line 3C-3C of Figure 3A;

Figure 4 is a view similar to Figure 2 showing an alternative embodiment of a blade holder in accordance with the present invention;

Figure 5 is a horizontal sectional view taken along line 5-5 of Figure 4;

Figure 6 illustrates another embodiment of a blade holder in accordance with the present invention;

Figure 7 is a horizontal sectional view taken along line 7-7 of Figure 6;

Figure 8 illustrates another embodiment of a blade holder in accordance with the present invention;

Figure 9 is a perspective view of one of the dovetail washers employed in the

arrangement shown in Figure 8;

Figure 10 illustrates still another embodiment of a blade holder in accordance with the present invention;

Figure 11 is a perspective view of one of the stepped washers used in the arrangement shown in Figure 10;

Figure 12 is a perspective view showing a further modification to blade holders embodying the concepts of the present invention; and

Figure 13 is a partial plan view of the blade holder and doctor back at one side of the papermachine.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

With reference initially to Figure 1, a doctor assembly in accordance with the present invention is generally depicted at 10 adjacent to a papermachine roll 12. Roll 12 is driven by conventional means (not shown) for rotation about an axis A_1 extending in the cross-machine direction. The doctor assembly includes a doctor blade 14, a blade holder 16, a doctor back 18, and a loading mechanism 20. The doctor back is mounted on the papermachine frame for pivotal movement about an axis A_2 extending in the cross-machine direction parallel to the rotational axis A_1 of roll 12. The loading mechanism 20 includes a piston-cylinder unit 22 acting through lever arm 24 to pivot the doctor back 18 about its axis A_2 in order to load the doctor blade 14 against the surface of the roll 12.

With reference additionally to Figures 2 and 3A-3C, it will be seen that the blade holder 16 includes a tray 26 with upstanding brackets 28 located between an unloading tube 30 and a loading tube 32. A top pressure plate 34 overlies the tubes 30, 32 and has depending brackets 36 which are connected to the brackets 28 by a rod 38 for pivotal movement about a third axis A_3 parallel to axes A_1 and A_2.

Fingers 40 cooperate with the underside of the top pressure plate 34 to retain the doctor blade 14 in its forwardly extending position. The tubes 30, 32 are fluid actuated, with tube 32 serving to coact with the force being applied by the loading mechanism 20 to apply the blade 14 to the surface of the roll 12. Tube 30 serves to unload the blade from the roll surface, in addition to acting as a front seal.

A pair of L-shaped confronting mounting strips 42a, 42b are secured to the underside of the tray 26. The mounting strips have horizontal ledges 44a, 44b spaced one from the other to define a continuous slot 46 communicating with an interior recess 47.

A shelf 50 extends forwardly from and forms an integral part of the doctor back 18. Shoulder screws 52 are threaded into the shelf 50 at spaced locations along the length of the slot 46. A locking strip 54 in interposed between the ledges 44a, 44b and the heads of the shoulder screws 52. The locking strip is slotted as at 56 to accommodate the shoulder screws, and the slots 56 are partially bordered by resilient tabs 58 which are bent upwardly out of the plane of the locking strip.

The locking strip 54 is slidable longitudinally with respect to the shelf 50 of the doctor back and the mounting strips 42a, 42b on the underside of the tray 26. When in the locked position as shown in Figures 3A and 3C, the tabs 58 are deflected downwardly by the heads of the shoulder screws 52 into the plane of the strip 54, thereby exerting a downward force which clamps the ledges 44a, 44b against the shelf 50, thus fixing the doctor holder 16 in its operative position on the doctor back 18. As can be best seen in Figure 3A, a pin 60 or the like at one side of the papermachine is employed to releasably fix the locking strip 54 in its locked position.

When it becomes necessary to clean or maintain the blade holder, the pin 60 is removed and the locking strip 54 is shifted to its unlocked position as shown in Figure 3B. This relieves the clamping force exerted by the resilient tabs 58, thus allowing the blade holder and doctor blade to be extracted longitudinally as a unit out of the papermachine. After cleaning and maintenance, the blade holder is longitudinally reinserted into the papermachine, and the clamping strip returned to its locked position.

An alternative embodiment of the invention is depicted in Figures 4 and 5, where a mounting strip 62a is secured to the underside of the tray 26. A second mounting strip 62b is connected to strip 62a by means of shoulder screws 64 extending through angled slots 66. The strips 62a, 62b coact to define a dovetailed slot 68 for receiving a dovetail strip 70 secured to the doctor back shelf 50 by screws 72. Longitudinal movement of the strip 62b in direction A will urge it laterally against the dovetail strip 70, thus clamping the blade holder in place. Longitudinal movement of the strip 62b in the opposite direction B will shift the strip 62b laterally away from strip 70, thus freeing the doctor holder for removal from the doctor back. If the strip 62b is only shifted slightly laterally, the blade holder can be slid longitudinally into and out of its operative position, whereas a more pronounced lateral shifting of the strip will permit the blade holder to be lifted from and lowered onto the doctor back.

In the embodiment shown in Figures 6 and 7, a male dovetail strip 74 is secured to the underside of the tray 26 and a female dovetail strip 76 is secured to the doctor back shelf 50. A set screw 78 at one side of the papermaking machine serves to fix male dovetail the strip 74 against sliding movement relative to the female dovetail strip 76. When the screw 78 is backed off as shown in Figure 7, the blade holder is free to slide longitudinally into and out of its operative position on the doctor back.

In the embodiment shown in Figures 8 and 9, a female dovetail strip 80 is secured to the underside of the tray 26, and frustoconical dovetail washers 82 are secured to and spaced along the length of the doctor back shelf 50.

In Figures 10 and 11, stepped washers 84 are secured at spaced locations along the underside of the tray 26, and a mounting strip 86 is secured to the doctor back shelf 50. The mounting strip 86 has an undercut channel 88 along which the stepped washers slide during longitudinal extraction and insertion of the blade holder.

Figure 12 illustrates another embodiment where a mounting strip 90 with an undercut channel 92 is secured to the doctor back shelf 50. The channel 92 is interrupted as at 94 at spaced locations along its length. This allows either the stepped washers 84 of Figures 11 or 12 stepped strip segments 96 which are secured to the underside of the blade holder tray 26 to slide along the channel 92 to positions at which they may exit via the interrupted sections 94 either laterally in direction A or vertically in direction B.

In the embodiments shown in Figures 8 to 12, a locking means of some type is provided at one side of the machine to prevent removal of the blade holder from the doctor back during operation of the papermachine. As shown in Figure 13, locking can be achieved by providing a bracket 98 on the tray 26 at one side of the papermachine which is detachably connected to the doctor back shelf 50 by a pin 100 or the like.

In light of the foregoing, it will now be appreciated by those skilled in the art that the present invention provides for ready separation of the doctor blade holder from the doctor back for removal from the papermachine. The embodiments illustrated in Figure 1-5 provide means for securely clamping the blade holder to the doctor back during operation of the papermachine. Other embodiments as illustrated in Figures 6-13 lock the blade holder in its operative position, but do not exert additional clamping forces. All arrangements are advantageous in that removability of the blade holder provides maintenance personnel with the opportunity to clean and perform maintenance outside of

the papermachine, without disturbing the doctor back.

We claim:

CLAIMS

1. Apparatus (10) for doctoring a roll (12) rotatably mounted in a papermachine for rotation about an axis (A_1) extending in a cross-machine direction, said apparatus comprising a doctor blade (14), a blade holder (16) for applying said doctor blade to the surface of said roll, and a doctor back (18) for supporting the blade holder, said blade holder including: a support tray (26) and support means (34, 40, 28, 36, 38) for supporting said doctor blade on said support tray for pivotal movement about another axis (A_3) parallel to the rotational axis (A_1) of said roll; characterized in that said support tray and said support means are components of an integral assembly provided with mounting means (42a, 42b, 52, 54; 62a, 62b, 70, 72; 74, 76; 80, 82; 84, 86; 90, 96) for removably mounting said integral assembly on said doctor back (18) in an operative position adjacent said roll and extending in said cross-machine direction; and with locking means (60; 78; 98, 100) for releasably securing said integral assembly in said operative position, said locking means being accessible and operable from a side of said papermachine.

2. Apparatus according to claim 1, wherein said blade holder (16) is moveable into and out of said operative position in said cross-machine direction.

3. Apparatus according to claim 1, wherein said blade holder (16) is moveable into and out of said operative position in a direction transverse to said cross-machine direction.

4. Apparatus according to claim 1, wherein said mounting means comprises mechanically internegageable components (42a, 42b, 54, 62a, 70, 76, 74, 80, 82, 86, 84), at least one of said components extending longitudinally in said cross-machine direction.

5. Apparatus according to claim 4, wherein said interengageable components (42a, 42b, 54, 62a, 70, 74, 76) each extend coextensively in said cross-machine direction.

6. Apparatus as claimed in claim 5, wherein said interengageable components include a slidable element (54).

7. Apparatus according to any one or more of claims 1 to 6, wherein the locking means takes the form of pins or screws (60, 78, 100).

8. Apparatus according to any one or more of claims 1 to 7, wherein the support means includes a pressure plate (34) and fingers (40) with the doctor blade (14) disposed between the pressure plate (34) and the fingers (40).

9. Apparatus according to claim 8 and further comprising:

fluid actuated loading means (30, 32) arranged in said support tray (26) on opposite sides of said other axis (A_3) for pivotally adjusting said pressure plate to forcibly apply said doctor blade to said roll.

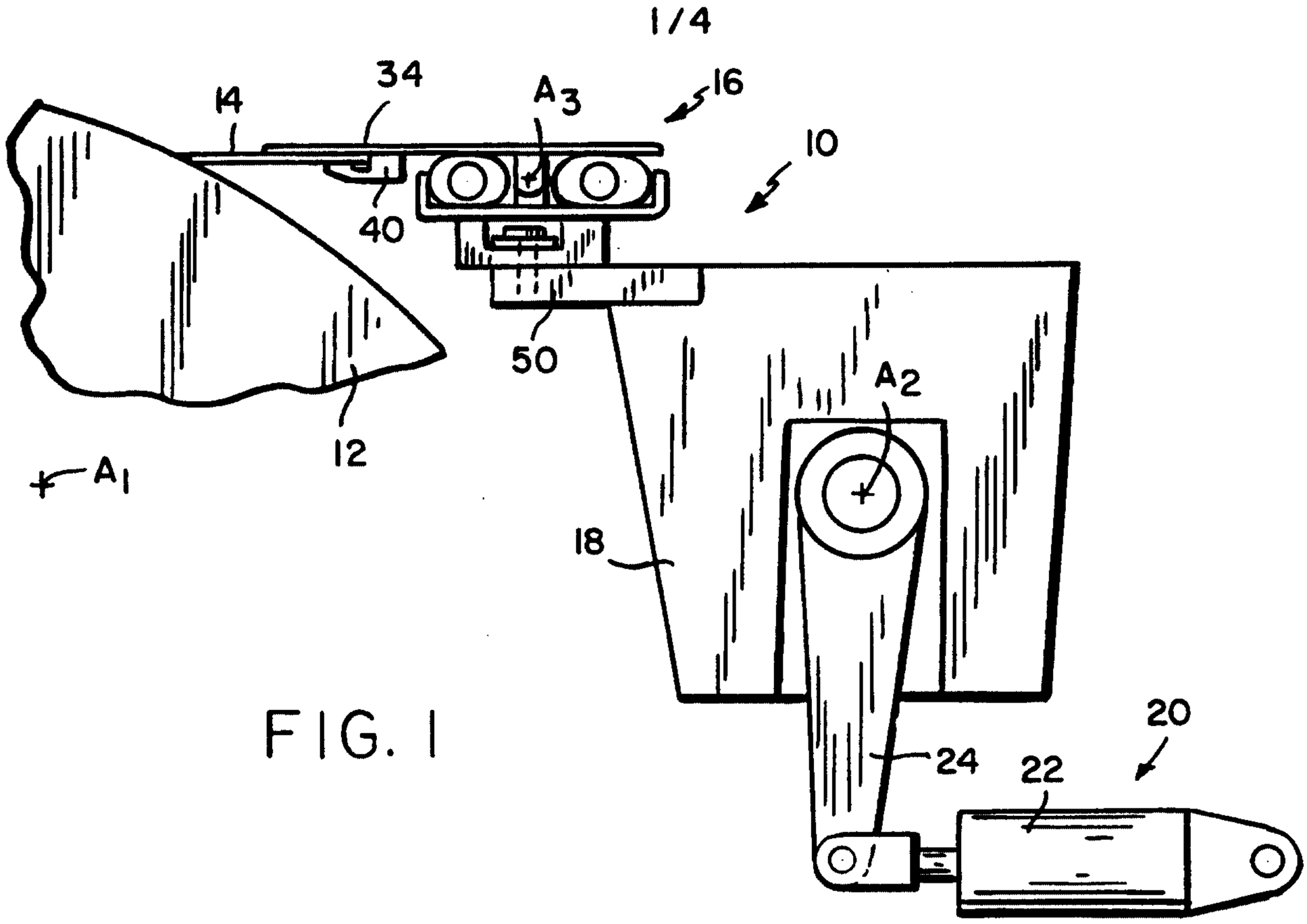


FIG. 1

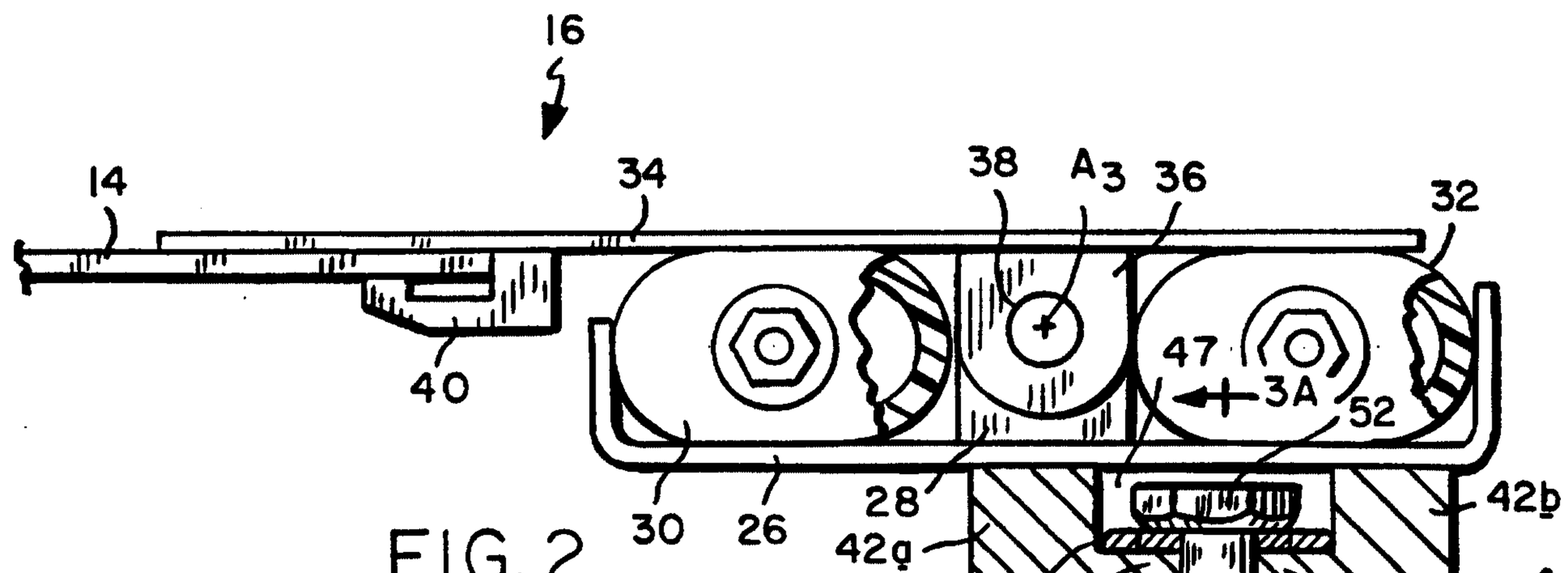


FIG. 2

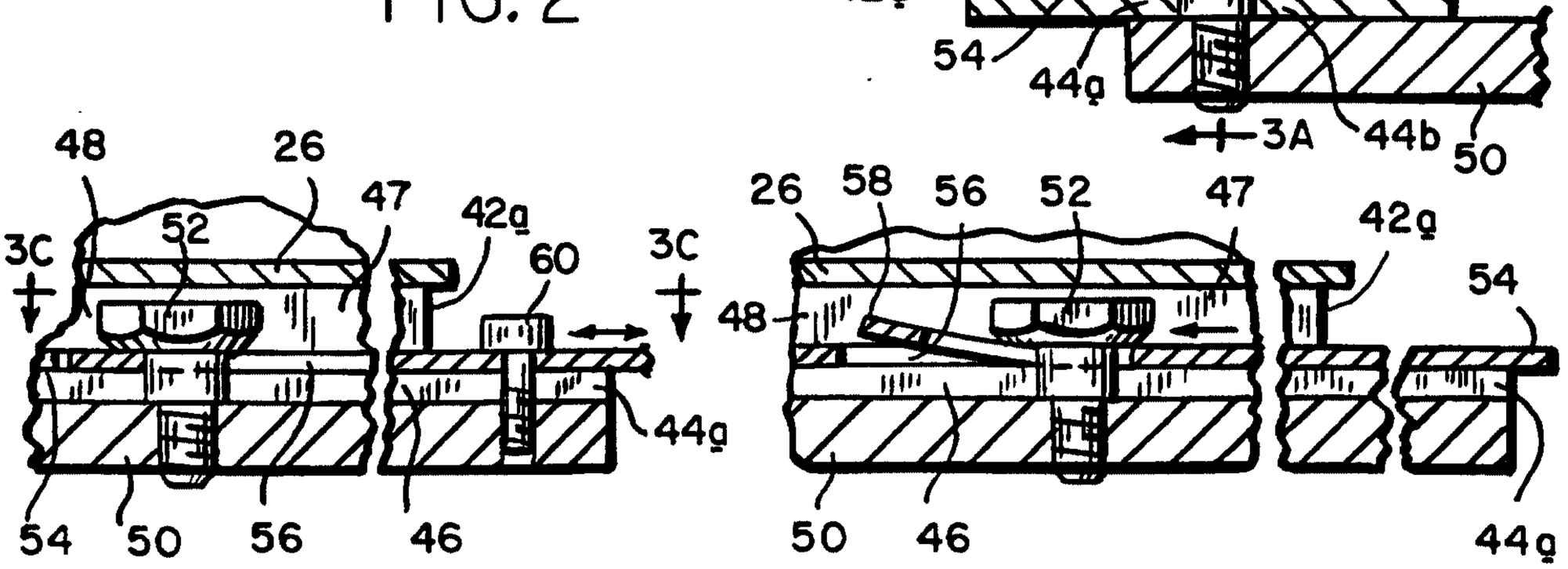


FIG. 3A

FIG. 3B

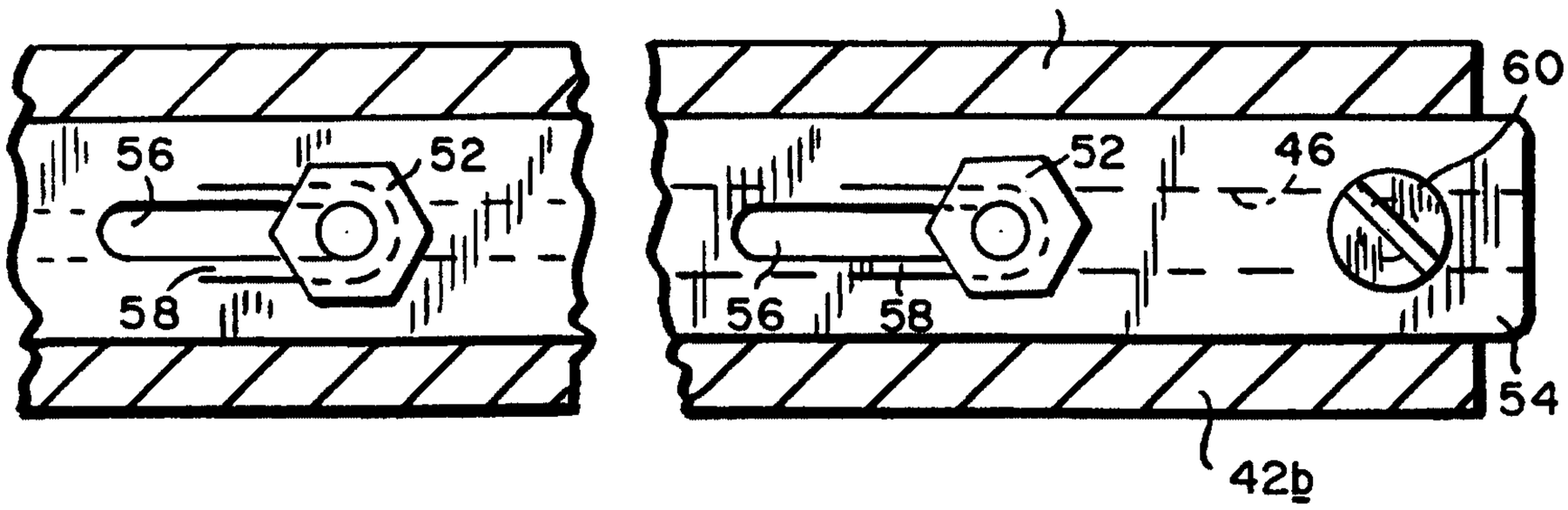


FIG. 3C

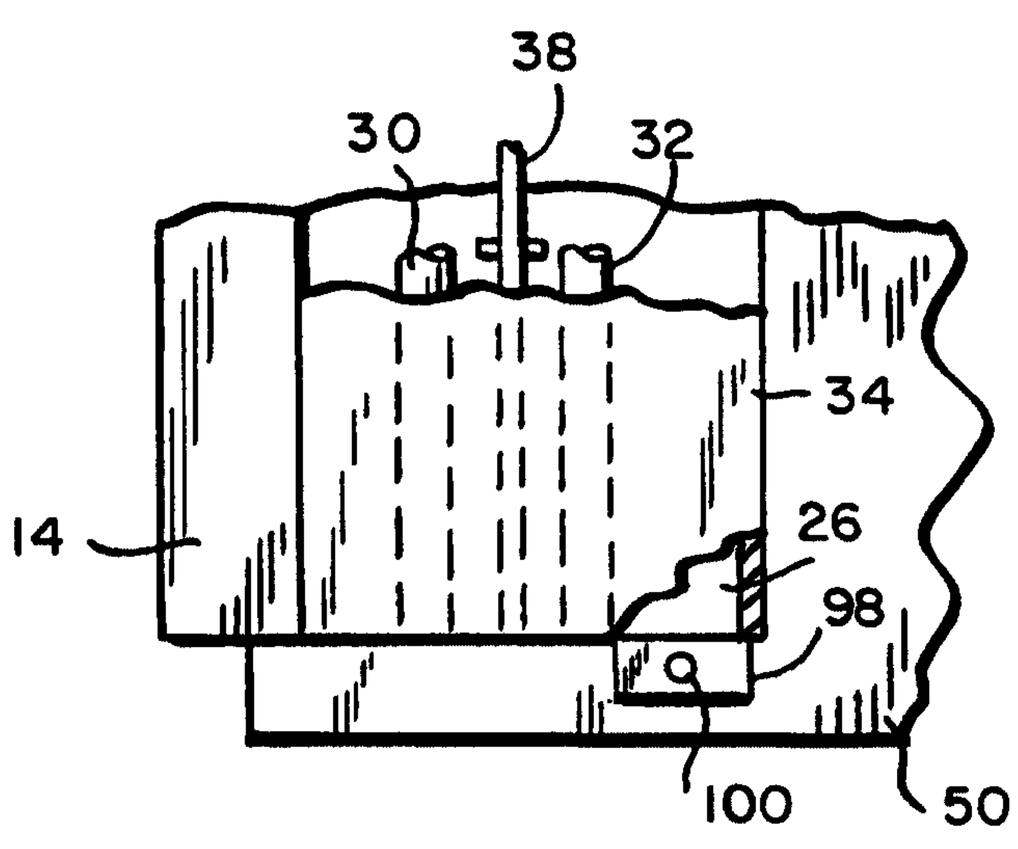


FIG. 13

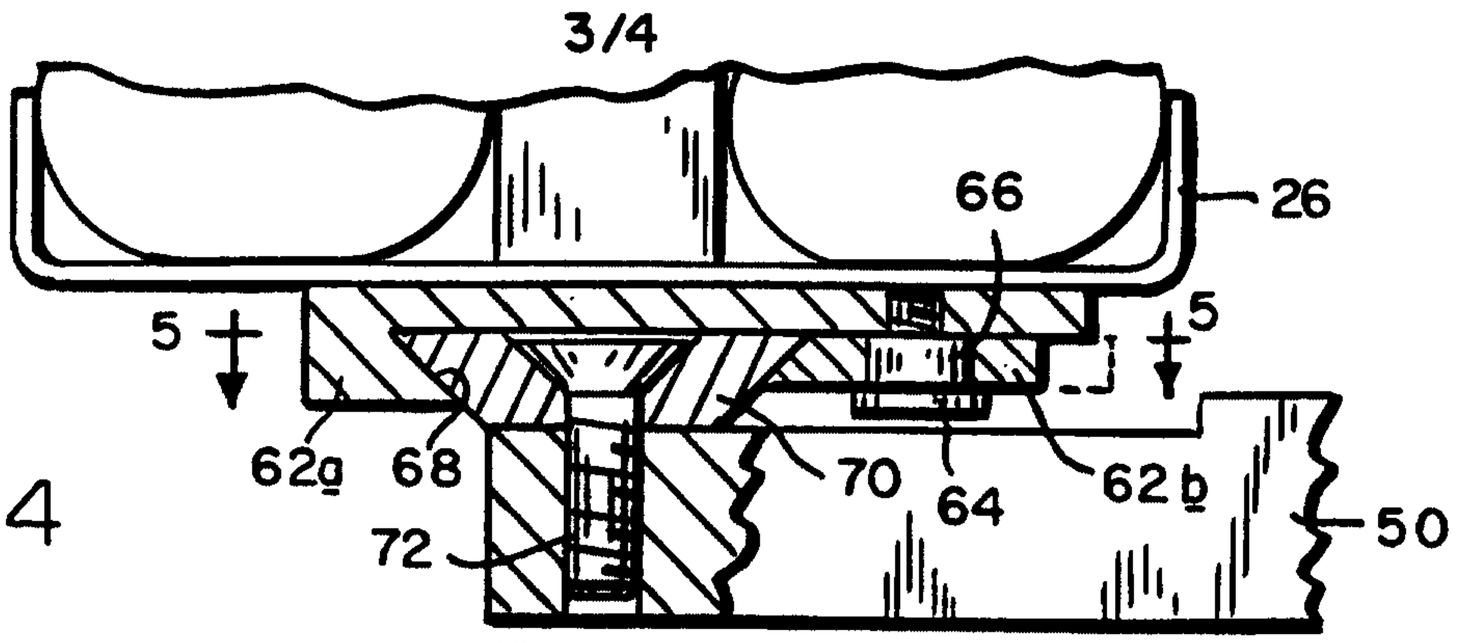


FIG. 4

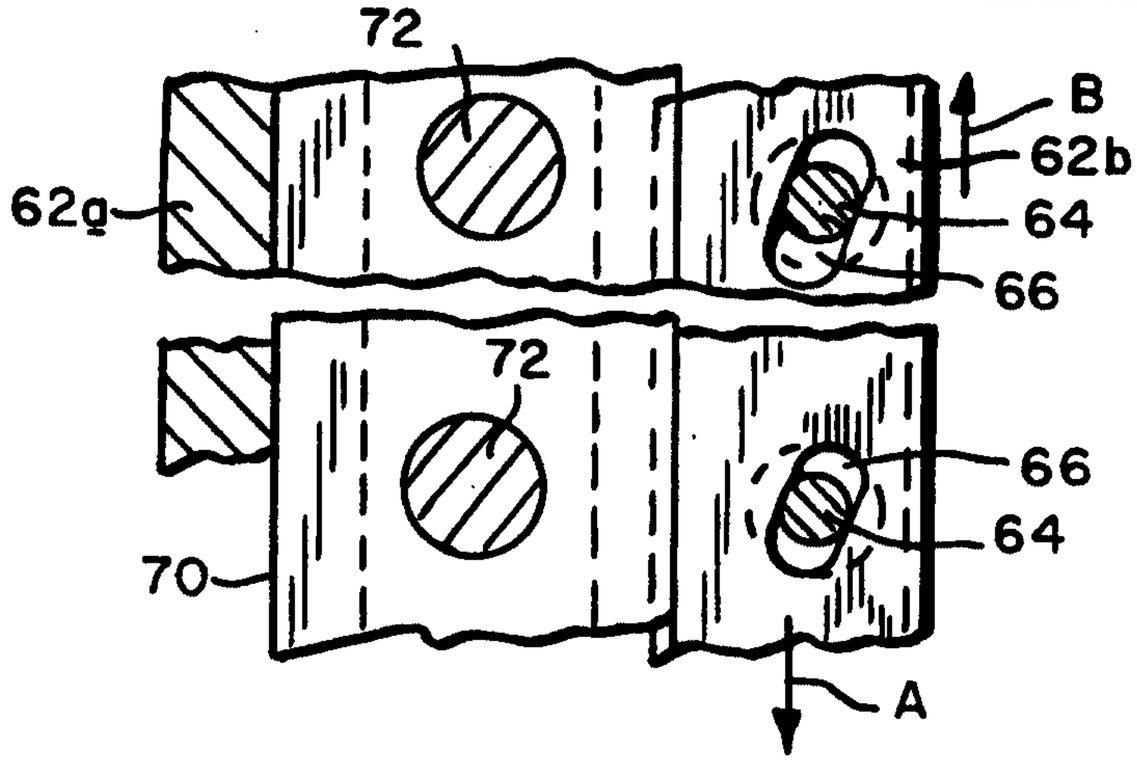


FIG. 5

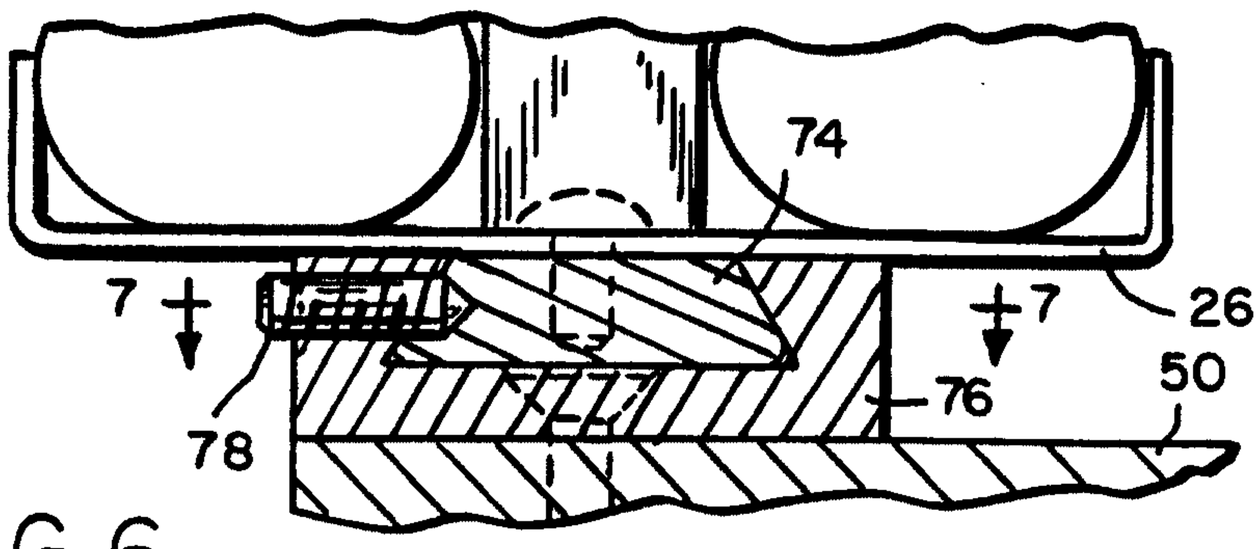
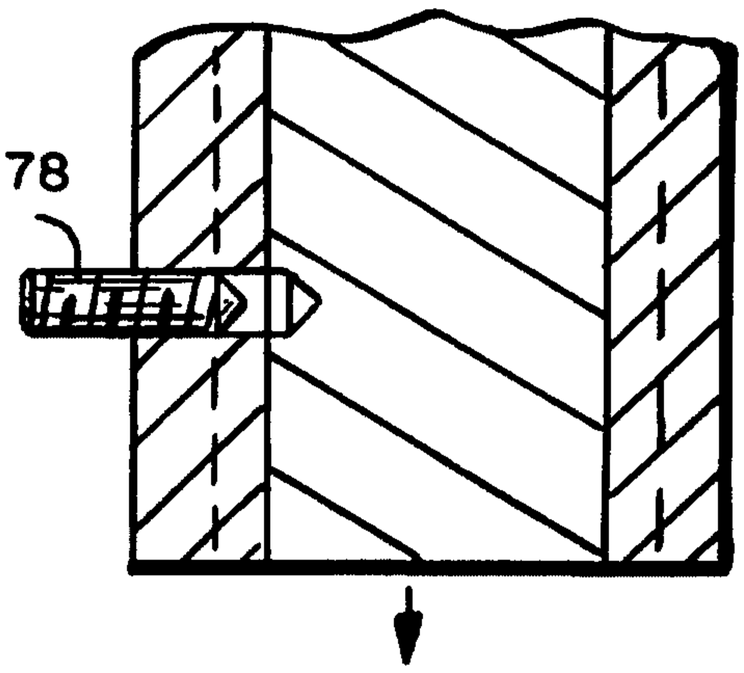


FIG. 6

FIG. 7



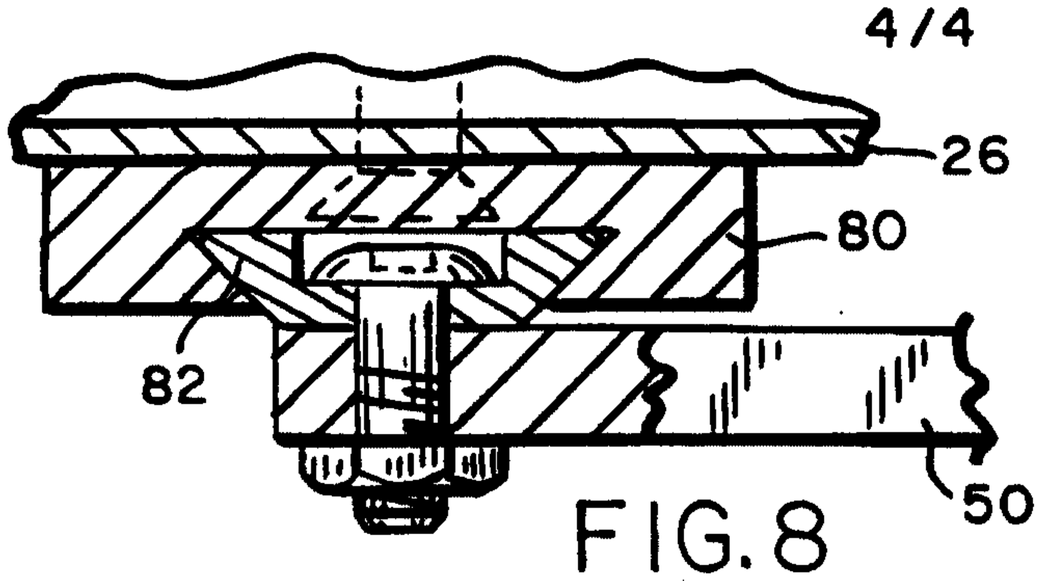


FIG. 8

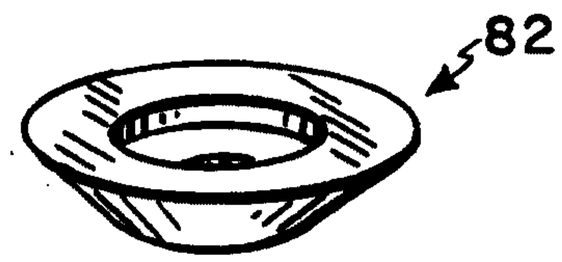


FIG. 9

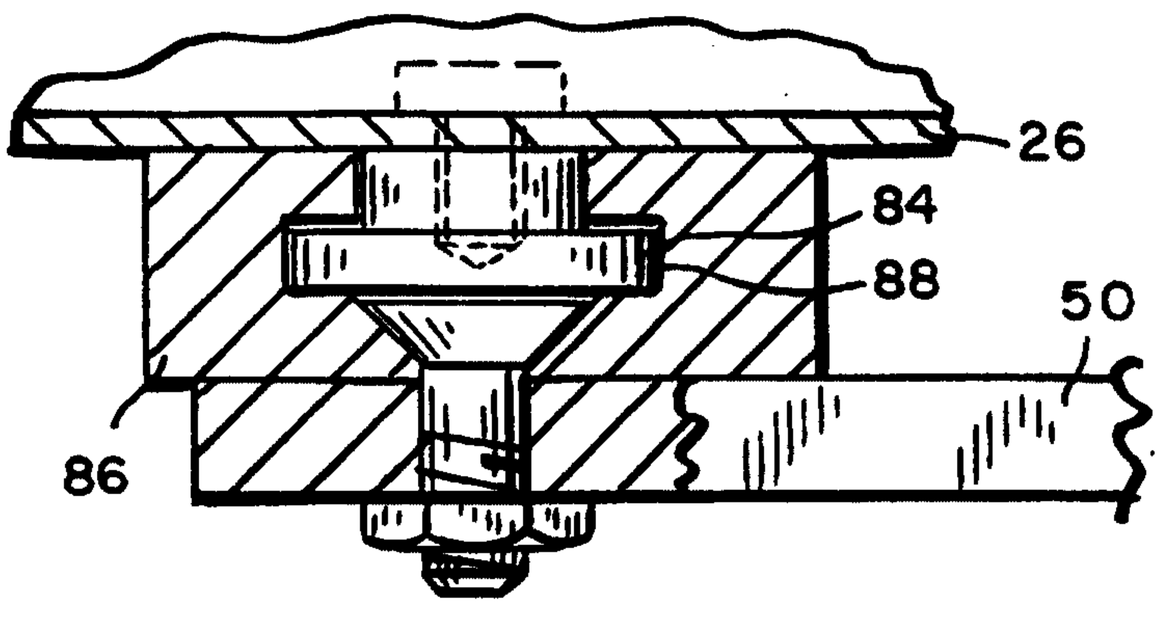


FIG. 10

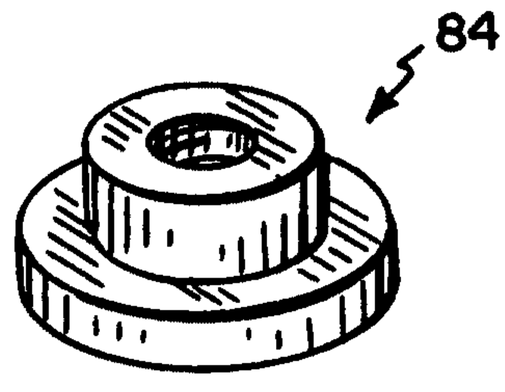


FIG. 11

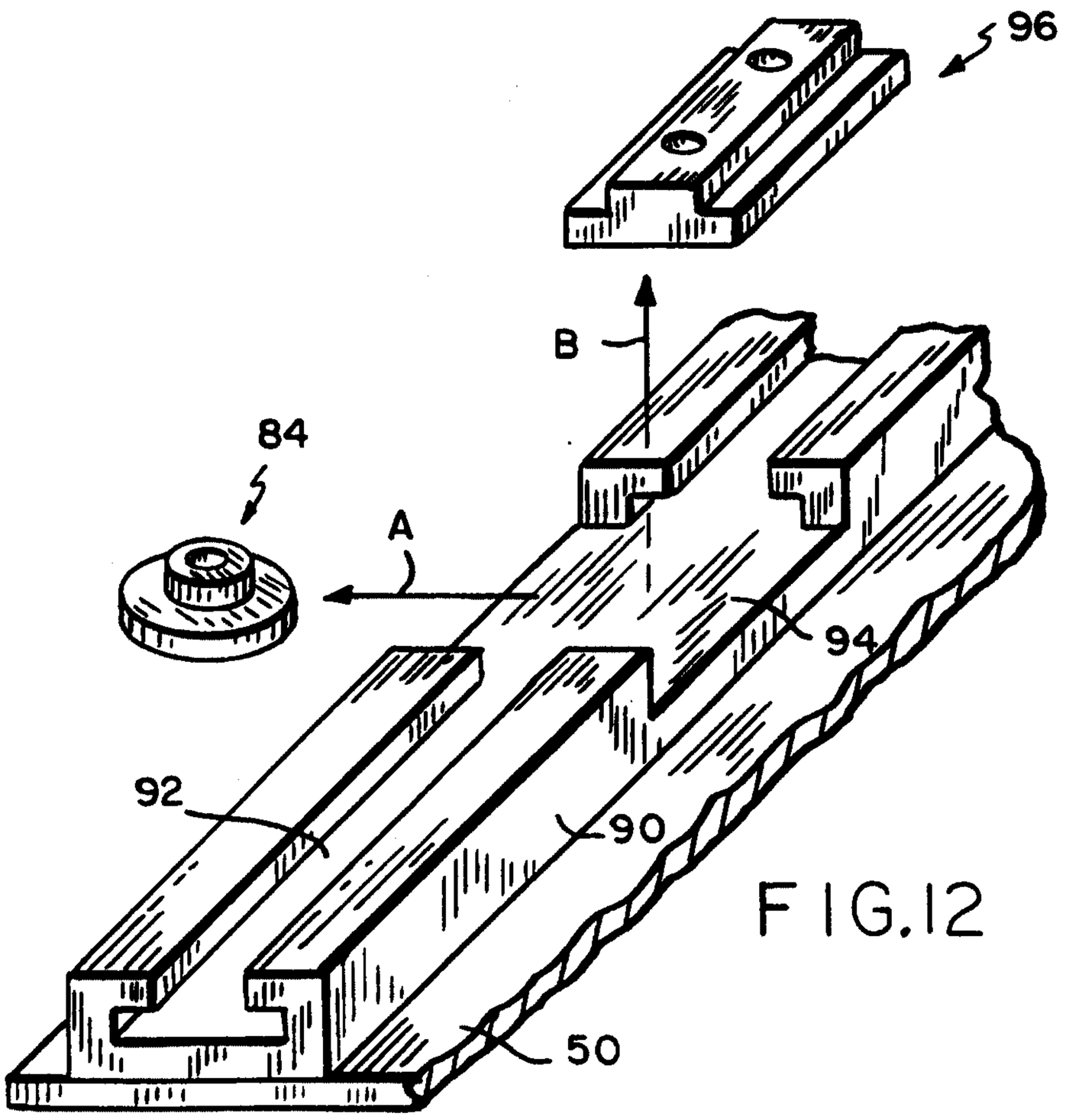
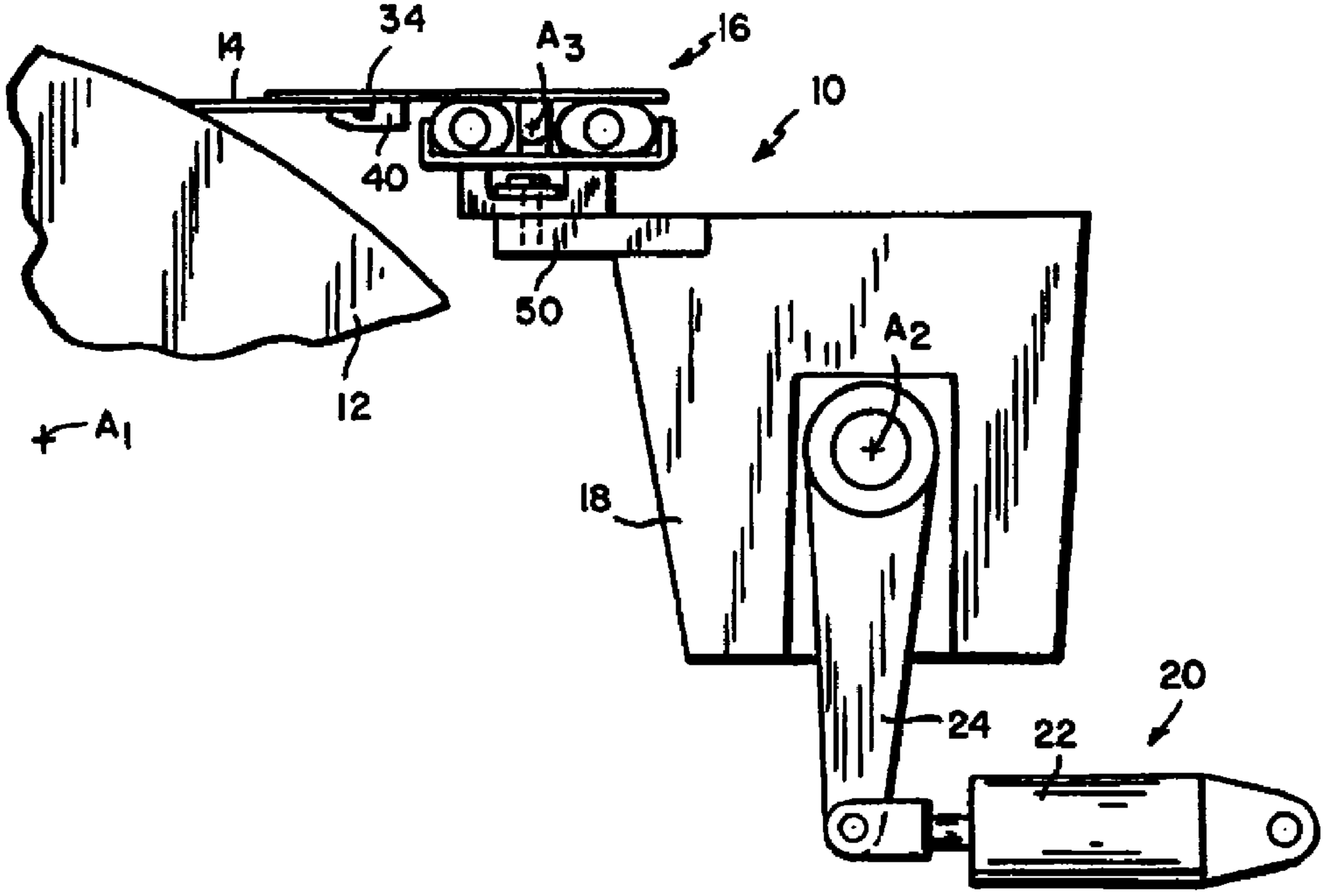


FIG. 12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