

CLIP FOR ATTACHING TAPE DRIVE MOTOR TO CHASSIS

RELATED APPLICATIONS

This application is a continuation-in-part of copending U.S. application Serial No. 08/531,635 filed 5 September 21, 1995 entitled "Clip for Attaching Tape Drive Motor to Chassis" by Mark W. Perona.

This application is related to applications HEAT DIFFUSER FOR MAGNETIC TAPE DRIVE, Perona, Serial Number 08/543,127, filed October 13, 1995; SNAP-IN CHASSIS FOR TAPE 10 DRIVE, Perona, Serial Number 08/543,133, filed October 13, 1995 and OPENING LEVER FOR MAGNETIC TAPE CARTRIDGE DOOR, Perona, Serial Number 08/543,134 filed October 13, 1995, which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

15 This invention relates to a magnetic tape drive and more particularly, to a clip for securing a motor to the chassis of a tape drive.

U.S. Patent 5,210,664-Perona shows a tape drive for use with so-called "Mini-Data" cartridges. There are standards 20 for these drives so that drives manufactured by different companies can read and write data interchangeably. These standards are referred to as the "QIC" (Quarter-Inch Cartridges) standards. One set of standards is referred to as the "QIC-80 Standards for 250-800 megabyte products." The QIC 25 standards specify the pressure of engagement between the driven roller in the cartridge and the drive roller in the drive. The

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pressure between the driven roller (wheel) in the cartridge and the drive roller (wheel) in the tape drive which is providing the drive must be at a certain level.

Recently, a new wide tape cartridge referred to as
5 "TRAVAN" has been announced for use with such drives. In such drives it is necessary to provide an electrical grounding connection between the tape drive motor and the printed circuit board which controls the operation of the drive.

It is an object of the present invention to simplify
10 the mounting of the motor on the chassis and to provide a good ground connection between the motor and the printed circuit board.

SUMMARY OF THE INVENTION

A magnetic tape drive for reading/writing data on
15 magnetic tape in a cartridge of the type in which a driven roller in the cartridge moves tape past a read/write head in the drive has a spring clip which mounts the motor on the chassis and provides a ground connection from the motor to the circuit board. The spring clip is snapped onto the chassis in
20 an interference fit. It has tabs which fit over ears on the motor plate to lock them into retainer grooves on the chassis. The tabs on the motor plate are on opposite sides of the drive shaft of the motor. The clip has a third tab locking the motor plate to the chassis at the rear of the motor. The third tab
25 is resilient to movement of the motor against the direction of insertion of the cartridge. This third tab provides the necessary load force between the drive roller on the motor and the driven roller in the cartridge. The third tab also provides an electrical connection for grounding the motor to
30 the circuit board.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of the tape drive of the present invention with a cartridge;

Fig. 2 is a perspective view partially broken away;

35 Fig. 3 is a perspective view partially broken away;

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Fig. 4 is a bottom view of the chassis; and

Fig. 5 is a perspective, exploded view of the bottom of the chassis; and

Fig. 6 is a perspective view of the bottom of the
5 chassis.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Tape drives of this type are for use with cartridges 10 having a metal baseplate 10a. The drive includes a drive roller 11 which engages a driven roller 12 in the cartridge to 10 move magnetic tape in the cartridge. The tape is read by a magnetic head 13 (Fig. 3) in the drive.

Motor 14 (Fig. 5) is mounted beneath the one-piece molded chassis 17. The one-piece molded chassis 17 has a three point interference fit suspending it in the pan 19. Pan 19 15 mounts the tape drive in relation to other components. For example, these tape drives are often used in conjunction with personal computers and other peripherals which are mounted in a rack. Molded plastic pan 19 and its case are mounted in this rack.

20 The chassis 17 has three horizontal planar mounting members including member 20. These snap into slots 25-27 in upstanding mounting members 28-30 on the pan. Planar mounting members 20 and 22 on the chassis fit into slots in the upstanding mounting members in the pan with an interference 25 fit. The planar mounting member 24 fits in slot 27 with a looser fit.

In accordance with the invention, a spring clip 44 (Figs. 5 and 6) has a locking tab 46 which clips over the rear of the chassis. The motor 14 has a motor plate 48 which is 30 secured to the motor by screws inserted through three holes, including 50, 51 (Fig. 2), in the motor plate. The motor plate has ears 54 and 56 which are placed in retainer holes 58 and 60 in the chassis (Fig. 4). Retainer holes 58 and 60 are at mating positions with ears 54 and 56 on the chassis.

35 Then, the spring clip 44 is inserted over the motor plate. (In the bottom views of Figs. 5 and 6, the clip is

inserted under the motor plate.) Clip 44 has tabs 62 and 64 which are inserted over the ears 54 and 56 to lock them into the retainer holes in the chassis. After the spring clip is inserted, the ears are held in the slots by the tabs 62 and 64
5 on the spring clip. The two tabs 62 and 64 are disposed on opposite sides of the drive shaft of the motor.

The spring clip has a tab 66 for engaging the rear of the motor. This tab is resilient to movement of the motor against the direction of insertion of the cartridge. The tab
10 66 provides a bias against the motor. This provides the necessary load force between the drive roller on the motor and the driven roller in the cartridge.

Rollers 68 and 70 engage slots on the cartridge to lock the cartridge in the drive. These rollers are held in
15 place by a torsion spring 76.

Further in accordance with the invention, another tab 68 provides an electrical connection to the chassis 17. Tab 68 has a hole 70 for making an electrical connection to the circuit board. This is used to complete a ground connection
20 between clip 44 and the circuit board.

Various modifications may be made to the preferred embodiment. The appended claims are, therefore, intended to cover all such modifications within the true spirit and scope of the invention.



**THIS SHEET HAS BEEN
REPLACED**WHAT IS CLAIMED IS:

1. A magnetic tape drive for reading/writing data on magnetic tape in a cartridge of the type in which a driven roller in said cartridge moves tape past a read/write head in
5 said drive, said drive comprising:

a motor having a drive shaft with means for moving said tape;

a chassis on which said motor is mounted;

a motor plate attached to said motor;

10 retainer means on said chassis for securing said plate to said chassis; and

a spring clip having an interference fit with said chassis, said clip being secured on said chassis with said interference fit to lock said motor plate to said retainer
15 means.

2. The magnetic tape drive recited in claim 1 wherein said motor plate has ears and said clip includes tabs which are inserted over said ears to lock them into said retainer means.

20 3. The magnetic tape drive recited in claim 2 wherein said retainer means on said chassis includes holes, said ears being held in said holes by said tabs.

4. The magnetic tape drive recited in claim 2 wherein said clip has two tabs disposed on opposite sides of
25 said drive shaft of said motor and wherein said chassis has retainer means on opposites sides of said drive shaft to mate with said tabs.

5. The magnetic tape drive recited in claim 2 further comprising:

30 a circuit board for said drive and wherein said clip further comprises:

means providing an electrical connection between said clip and said circuit board.





AMENDED CLAIMS

[received by the International Bureau on 10 January 1997 (10.01.97);
original claims 2 and 3 cancelled; original claims 1,4 and 5 amended (1 page)]

1. A magnetic tape drive for reading/writing data on magnetic tape in a cartridge of the type in which a driven roller in said cartridge moves tape past a read/write head in said drive, said drive comprising:

a motor having a drive shaft with means for moving said tape;

a chassis on which said motor is mounted;

a motor plate attached to said motor, said motor plate having ears;

retainer means on said chassis, said retainer means being holes in said chassis for securing said plate to said chassis; and

a spring clip having an interference fit with said chassis, said clip including tabs, said clip being secured on said chassis with said interference fit, said tabs being inserted over said ears to lock said motor plate to said retainer means.

2. Canceled

3. Canceled

4. The magnetic tape drive recited in claim 1 wherein said clip has two tabs disposed on opposite sides of said drive shaft of said motor and wherein said retainer means are on opposites sides of said drive shaft to mate with said tabs.

5. The magnetic tape drive recited in claim 1 further comprising:

a circuit board for said drive and wherein said clip further comprises:

means providing an electrical connection between said clip and said circuit board.

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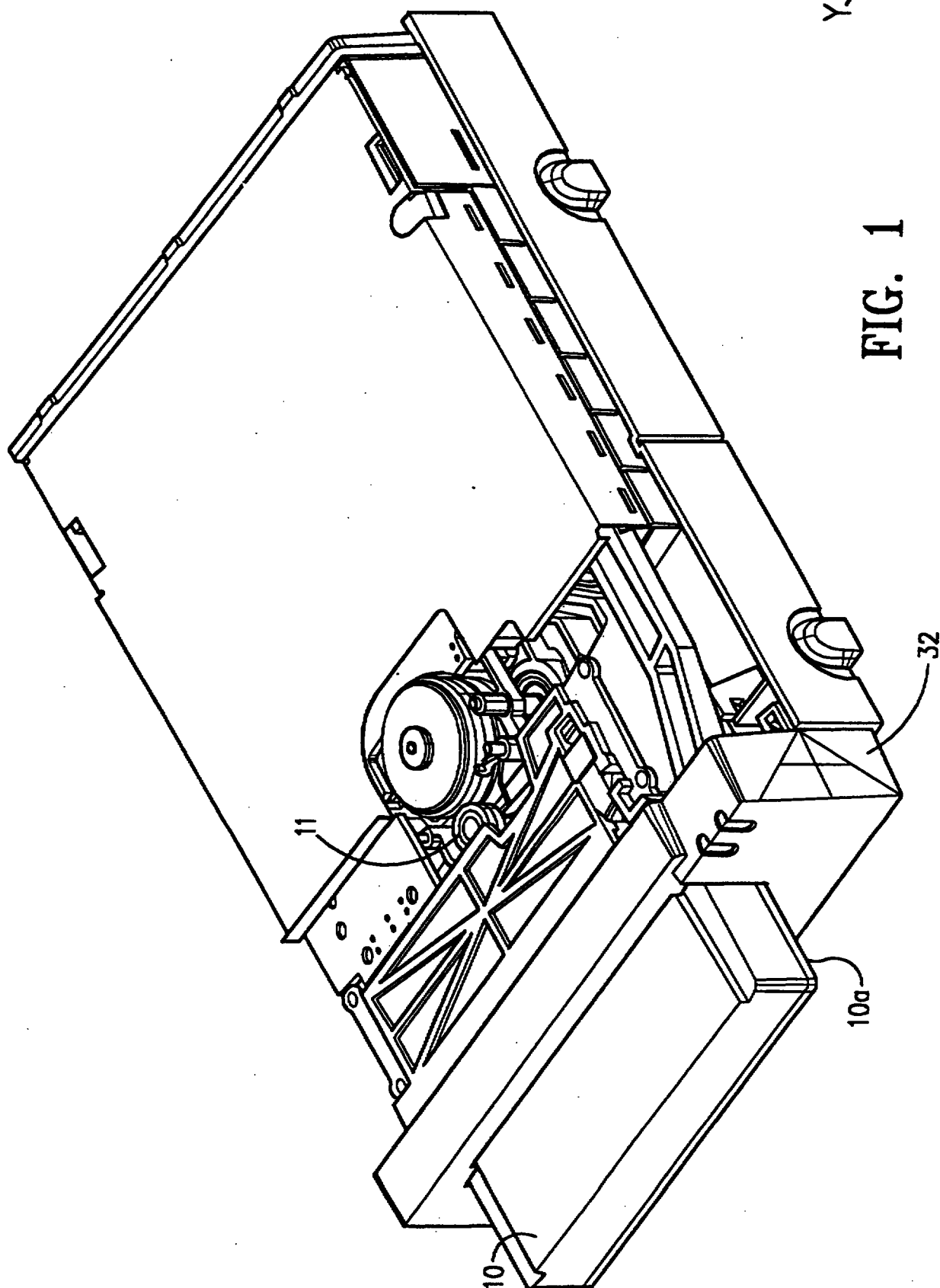
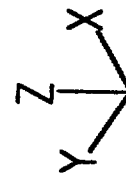


FIG. 1

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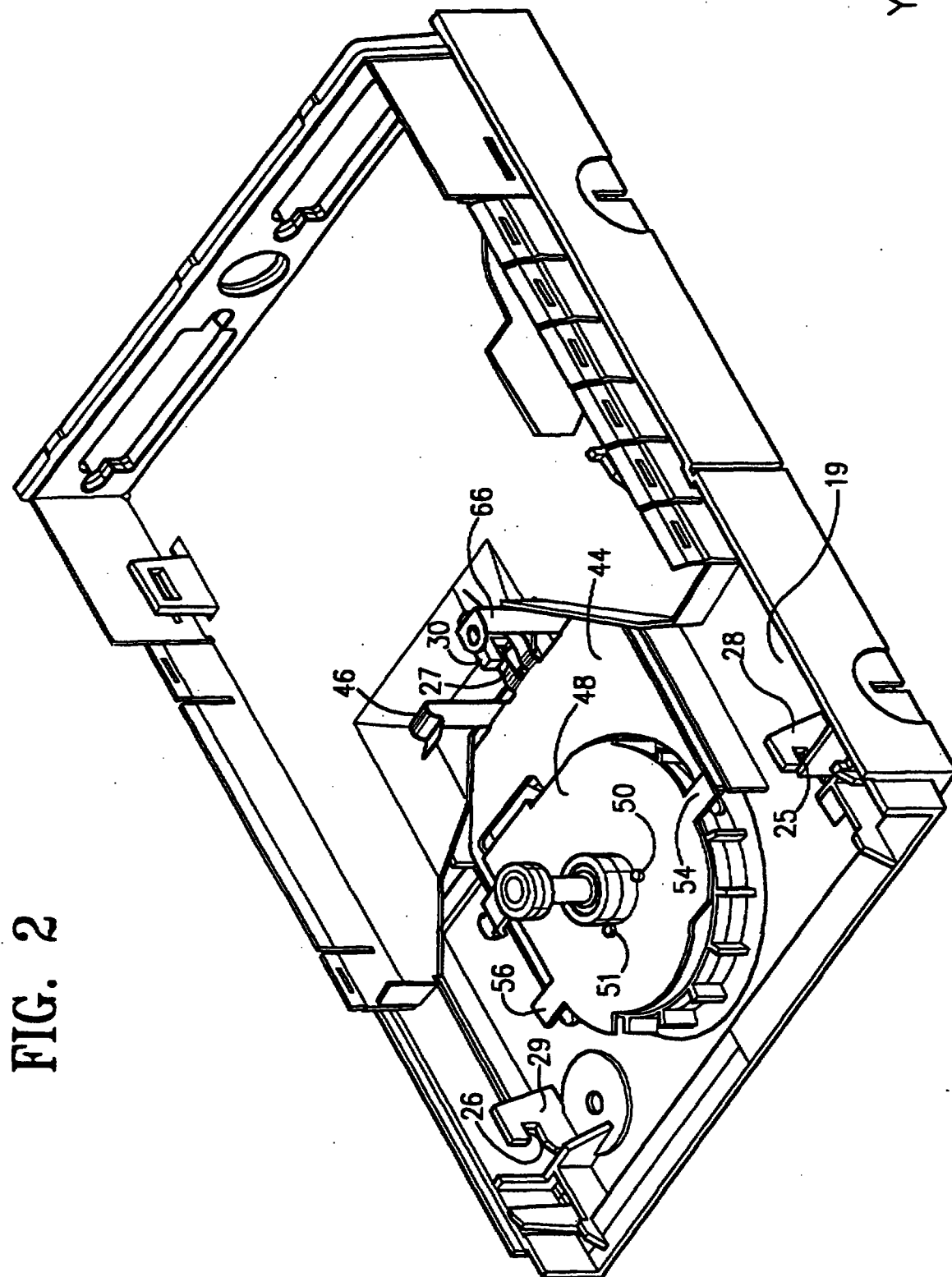
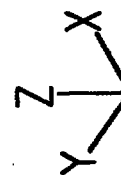
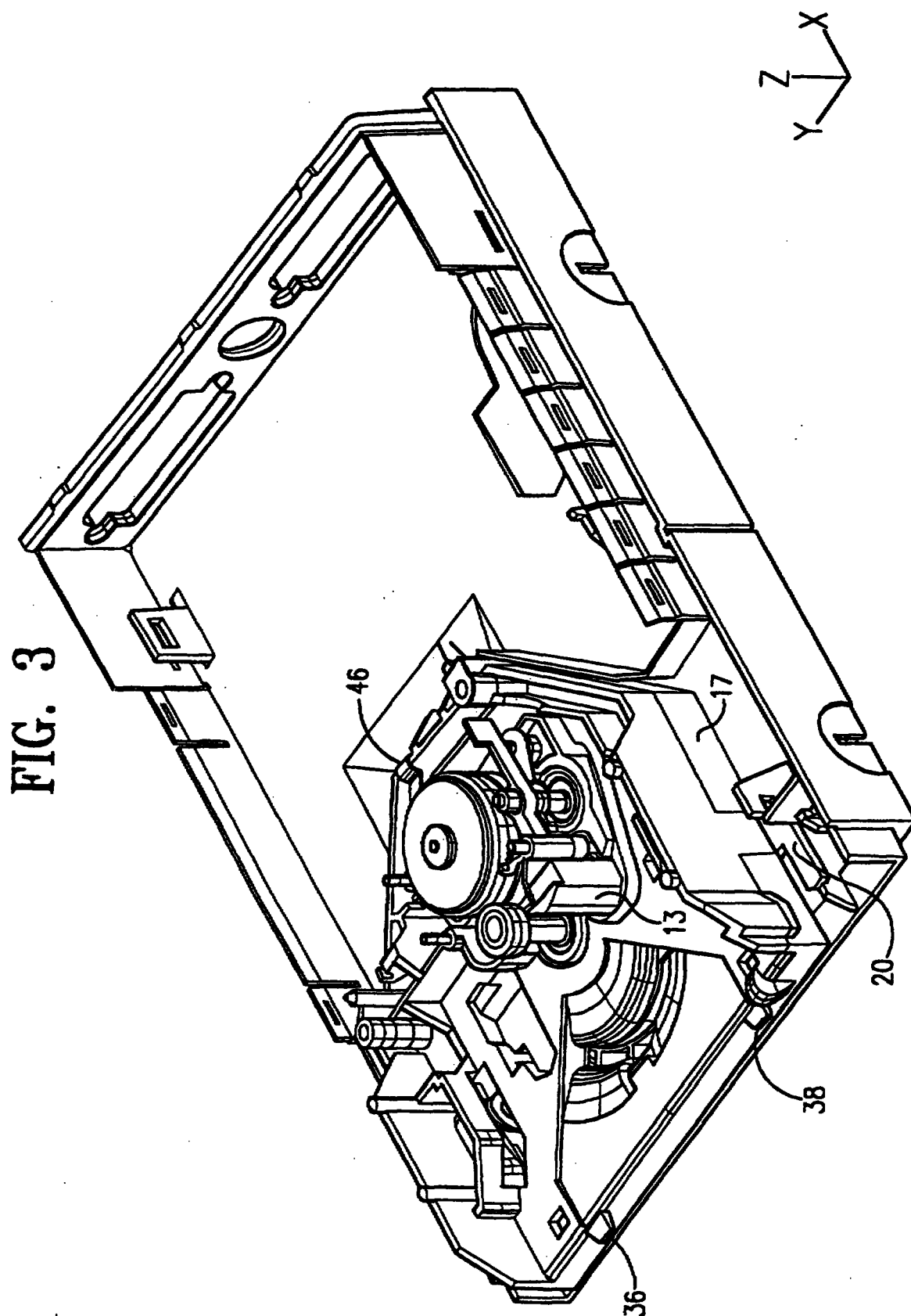


FIG. 2

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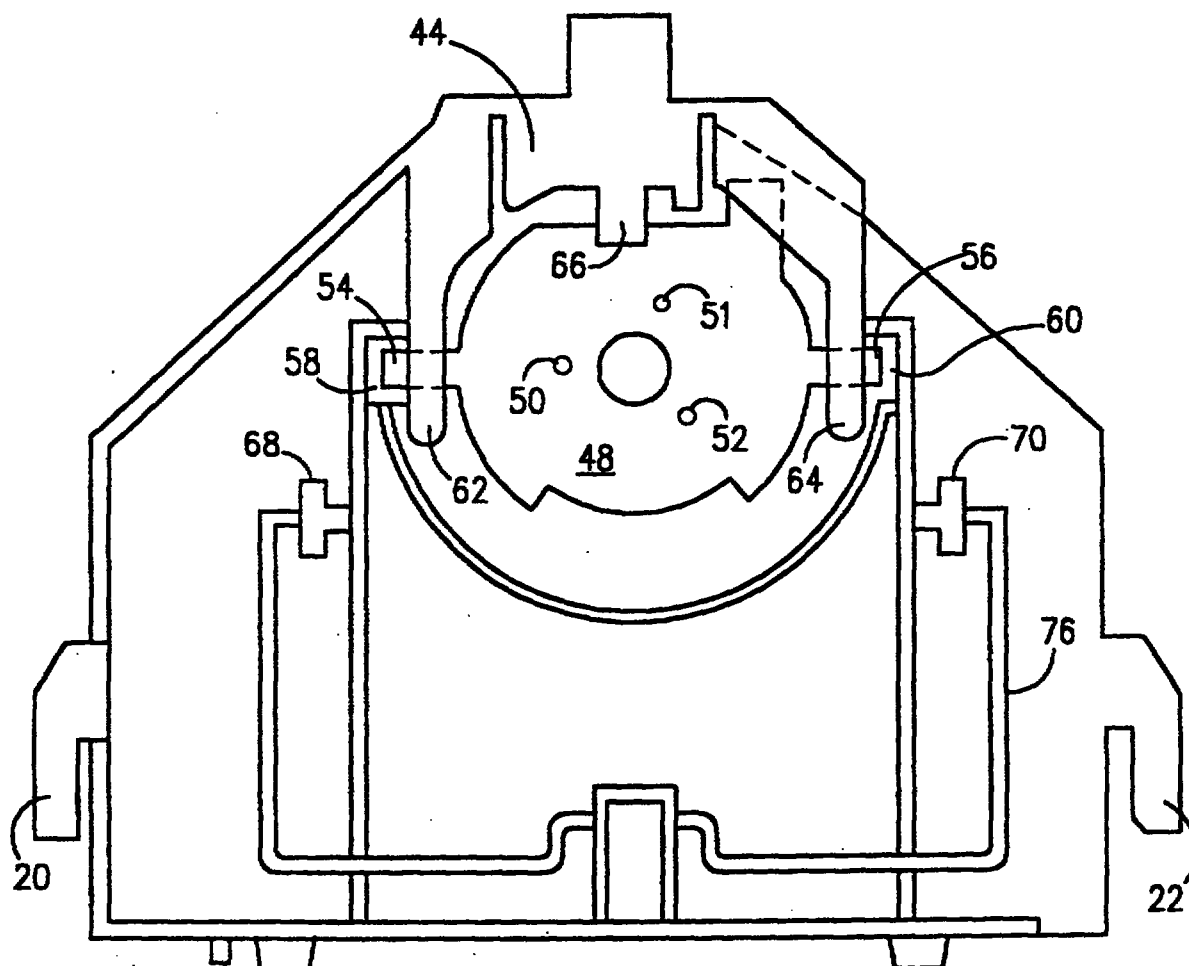
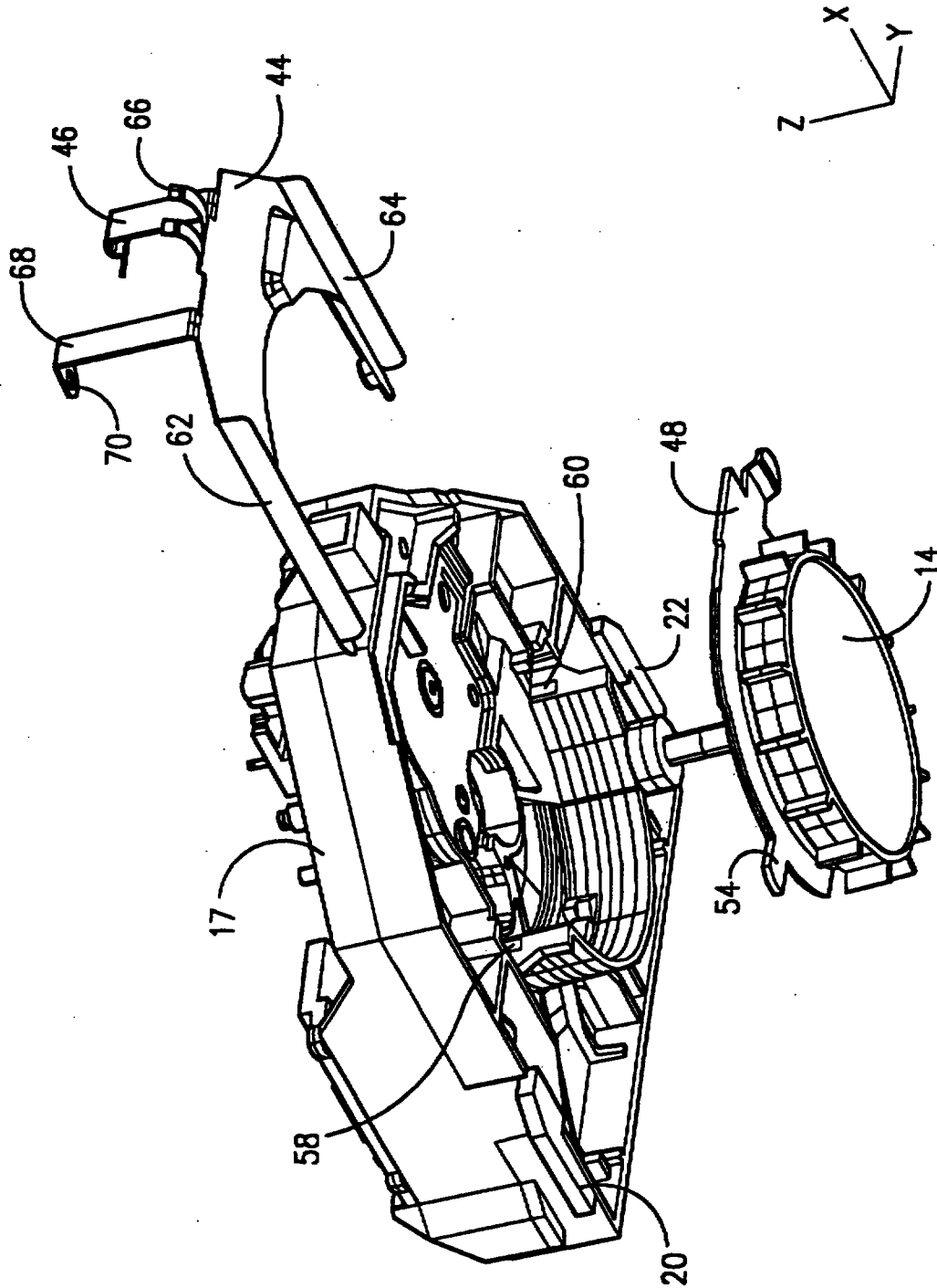


FIG. 4

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FIG. 5



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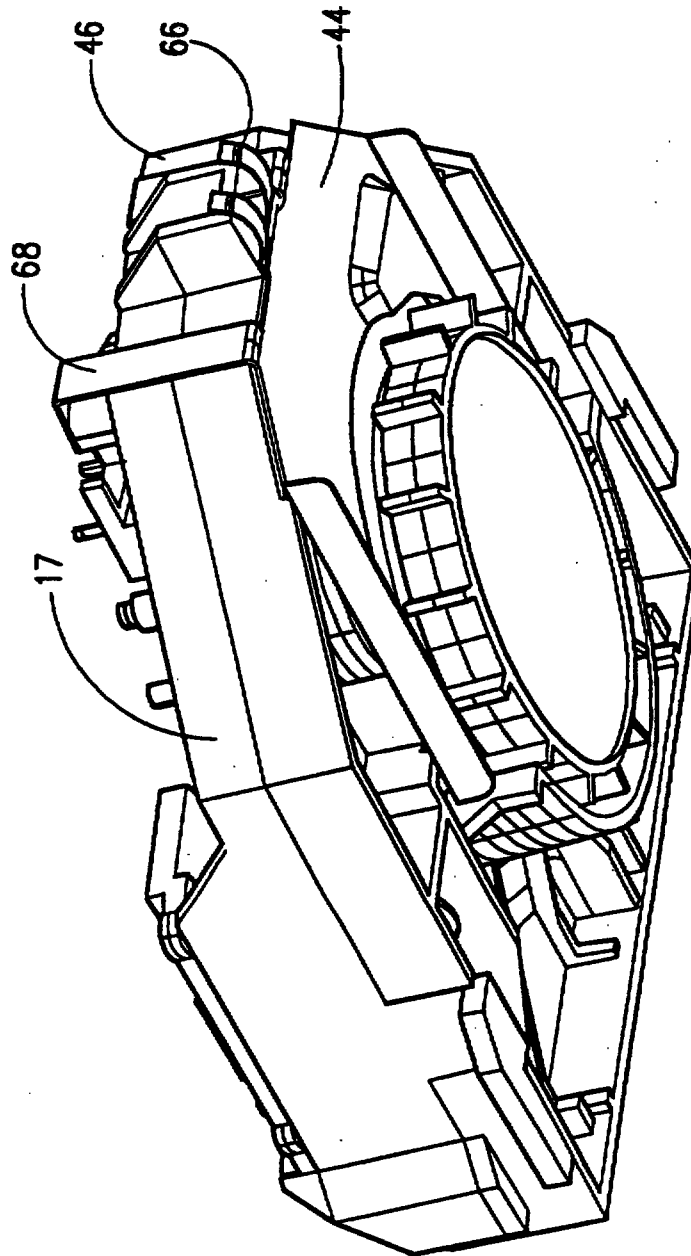
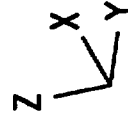


FIG. 6

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REPLACED

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WHAT IS CLAIMED IS:

1. A magnetic tape drive for reading/writing data on magnetic tape in a cartridge of the type in which a driven roller in said cartridge moves tape past a read/write head in said drive, said drive comprising:

a motor having a drive shaft with means for moving said tape;

a chassis on which said motor is mounted;

a motor plate attached to said motor, said motor plate having ears;

retainer means on said chassis, said retainer means being holes in said chassis for securing said plate to said chassis; and

a spring clip having an interference fit with said chassis, said clip including tabs, said clip being secured on said chassis with said interference fit, said tabs being inserted over said ears to lock said motor plate into said holes.

2. Canceled

3. Canceled

4. The magnetic tape drive recited in claim 1 wherein said clip has two of said tabs disposed on opposite sides of said drive shaft of said motor and wherein said holes are on said opposite sides of said drive shaft to mate with said two tabs.

5. The magnetic tape drive recited in claim 1 further comprising:

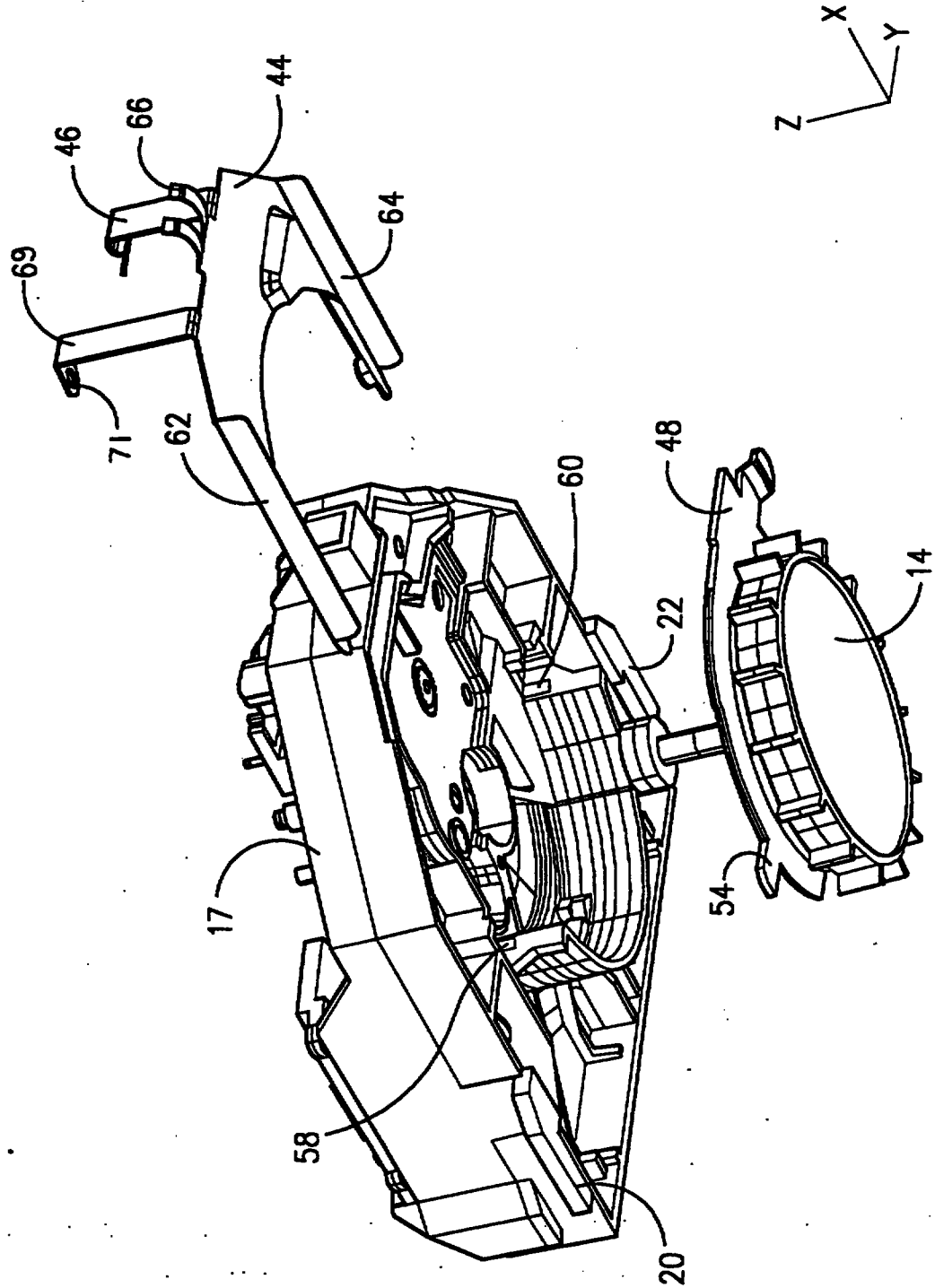
a circuit board for said drive and wherein said clip further comprises:

means providing an electrical connection between said clip and said circuit board.

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FIG. 5



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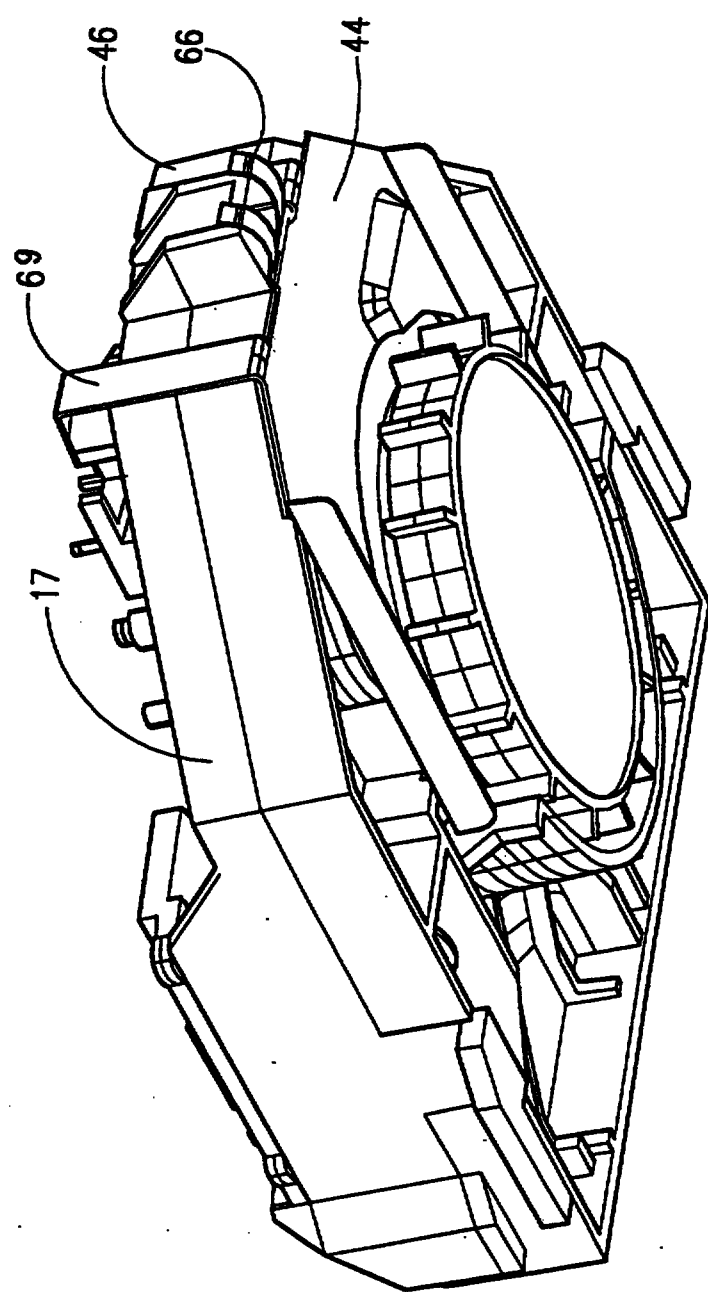
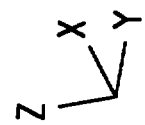


FIG. 6

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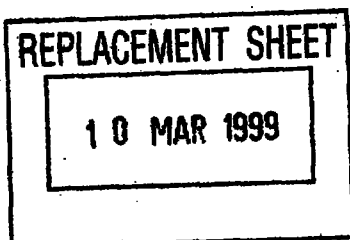
inserted under the motor plate.) Clip 44 has tabs 62 and 64 which are inserted over the ears 54 and 56 to lock them into the retainer holes in the chassis. After the spring clip is inserted, the ears are held in the slots by the tabs 62 and 64
5 on the spring clip. The two tabs 62 and 64 are disposed on opposite sides of the drive shaft of the motor.

The spring clip has a tab 66 for engaging the rear of the motor. This tab is resilient to movement of the motor against the direction of insertion of the cartridge. The tab
10 66 provides a bias against the motor. This provides the necessary load force between the drive roller on the motor and the driven roller in the cartridge.

Rollers 68 and 70 engage slots on the cartridge to lock the cartridge in the drive. These rollers are held in
15 place by a torsion spring 76.

Further in accordance with the invention, another tab ~~69~~⁶⁹ provides an electrical connection to the chassis 17. Tab ~~69~~⁶⁹ has a hole ~~70~~⁷¹ for making an electrical connection to the circuit board. This is used to complete a ground connection
20 between clip 44 and the circuit board.

Various modifications may be made to the preferred embodiment. The appended claims are, therefore, intended to cover all such modifications within the true spirit and scope of the invention.





WHAT IS CLAIMED IS:

1. A magnetic tape drive for reading/writing data on magnetic tape in a cartridge of the type in which a driven roller in said cartridge moves tape past a read/write head in said drive, said drive comprising:

a motor having a drive shaft with means for moving said tape;

a chassis on which said motor is mounted;

a motor plate attached to said motor, said motor plate having ears;

retainer means on said chassis, said retainer means being holes in said chassis for securing said plate to said chassis; and

a spring clip having an interference fit with said chassis, said clip including tabs, said clip being secured on said chassis with said interference fit, said tabs being inserted over said ears to lock said motor plate into said holes.

~~2. Canceled~~

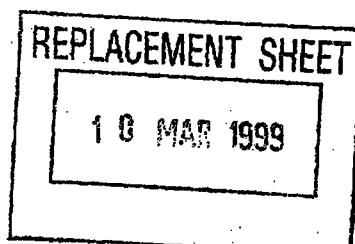
~~3. Canceled~~

2 ~~4~~ The magnetic tape drive recited in claim 1 wherein said clip has two of said tabs disposed on opposite sides of said drive shaft of said motor and wherein said holes are on said opposite sides of said drive shaft to mate with said two tabs.

3 ~~5~~ The magnetic tape drive recited in claim 1 further comprising:

a circuit board for said drive and wherein said clip further comprises:

means providing an electrical connection between said clip and said circuit board.



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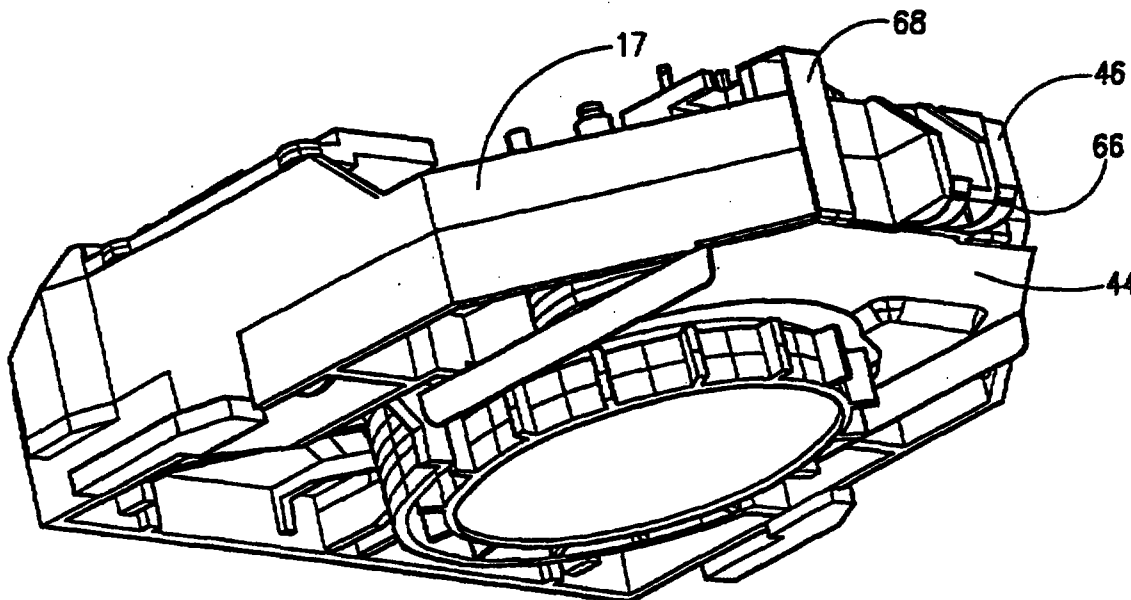


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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US96/15019 (22) International Filing Date: 20 September 1996 (20.09.96) (30) Priority Data: ① 08/531,635 ✓ 21 September 1995 (21.09.95) ✓ US ✓ ② 08/543,128 ✓ 13 October 1995 (13.10.95) ✓ US ✓ (71) Applicant: ① IOMEGA CORPORATION [US/US]; 1821 West 4000 South, Roy, UT 84067 (US). (72) Inventor: ① PERONA, Mark, W. ✓ 9385 Black Hills Way, San Diego, CA 92129 (US). (74) Agent: KURTZ, Richard, E.; Woodcock Washburn Kurtz Mackiewicz & Norris, 46th floor, One Liberty Place, Philadelphia, PA 19103 (US).	(81) Designated States: CA, JP, SG, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published With international search report. ✓ With amended claims. ✓ → Assignment (PF24) Ditto, Inc. (a Delaware Corporation) 1900 Pike Road, Building E Longmont, Colorado 80501 USA.	

(54) Title: CLIP FOR ATTACHING TAPE DRIVE MOTOR TO CHASSIS ✓



(57) Abstract

A magnetic tape drive for reading/writing data on magnetic tape in a cartridge of the type in which a driven roller in the cartridge moves tape past a read/write head in the drive has a spring clip (44) which holds the motor plate of the tape drive motor on the chassis (17). The spring clip (44) is secured on the chassis (17) with a snap-on interference fit. The spring clip (44) has a locking tab (46) and a tab (66) that engages the rear of the motor. The spring clip (44) bears against the motor and also provides an electrical ground connection from chassis ground to the circuit board.