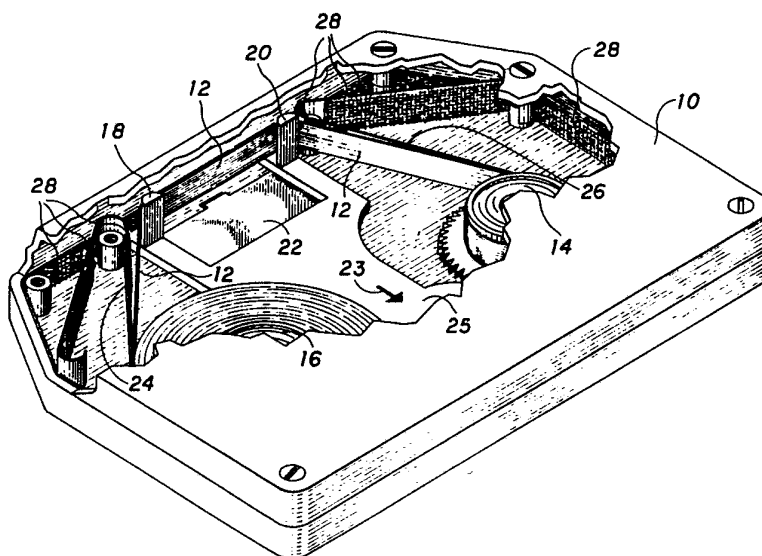




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US90/06488 (22) International Filing Date: 14 November 1990 (14.11.90) (30) Priority data: 440,924 24 November 1989 (24.11.89) US (71) Applicant: EASTMAN KODAK COMPANY [US/US]; 343 State Street, Rochester, NY 14650 (US). (72) Inventor: KARSH, Herbert ; 2955 Chillon Way, Laguna Beach, CA 92651 (US). (74) Agent: MONTEITH, Dennis, P.; 343 State Street, Roches- ter, NY 14650-2201 (US).		(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), DK (European patent), ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent). Published <i>With international search report.</i>

(54) Title: DEBRIS CONTROL IN AN ENCLOSED MAGNETIC TAPE CARTRIDGE



(57) Abstract

In order to diminish the effects of debris on recording and playback in a cartridge loaded recorder, adhesive material (28) is placed inside the enclosed magnetic tape cartridge (10). The adhesive is placed on appropriate interior walls and other available surfaces of the cartridge and is covered by a protective screen (27) having holes (29) through which the debris may pass. The size of the holes is large relative to the debris size. The adhesive material is located clear of the magnetic tape path, magnetic heads and guides and if an inadvertent tape loop occurs in the cartridge, the protective screen insures that the magnetic tape cannot come into contact with the adhesive proper. Any loose debris however incident on the holes of the protective screen is captured and immobilized by sticking to the adhesive material.

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DEBRIS CONTROL IN AN ENCLOSEDMAGNETIC TAPE CARTRIDGEBACKGROUND OF THE INVENTION1. Technical Field Of The Invention

5 This invention relates to a magnetic tape cartridge, and in particular to control of debris within a magnetic tape cartridge.

2. Description Relative to The Prior Art

10 An important reason for the use of an enclosed cartridge in the magnetic recording art is to protect the magnetic tape from particles, dust and debris present in the environment. Such particles when adherent to the tape during recording or playback result in dropouts and loss of signal
15 due to separation of the tape surface from the magnetic head. While the tape is protected from the outside environment by the enclosed cartridge, by the same token, detritus such as magnetic oxide particles from the magnetic coating, conductive
20 particles from the backside of the tape, and metal or ferrite particles due to head wear, are retained within the cartridge. The presence of these particles is similarly detrimental to recorder operation in causing dropouts, signal loss, and
25 accelerated head wear due to abrasion.

DISCLOSURE OF INVENTION

 In order to diminish the effects of debris on recording and playback in a cartridge loaded recorder, adhesive material is placed inside the
30 enclosed magnetic tape cartridge. The adhesive is placed on appropriate interior walls and other available surfaces of the cartridge, and is covered by a protective screen having holes through which the debris may pass. The size of the holes is large
35 relative to the debris size. The adhesive material

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is located clear of the magnetic tape path, magnetic heads and guides, and if an inadvertent tape loop occurs, the protective screen insures that the magnetic tape cannot come into contact with the adhesive proper. Loose debris, however, incident on the holes of the protective screen is captured and immobilized by sticking to the adhesive material.

BRIEF DESCRIPTION OF DRAWINGS

The invention will be described with respect to the figures of which:

Fig. 1 is a perspective view of a magnetic tape cartridge showing a screen protected adhesive located therein in accordance with the invention, and

Fig. 2 is an enlarged view of a portion of the screen protected adhesive of Fig. 1.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring to Fig. 1a, a magnetic tape cartridge 10 comprises an enclosure containing magnetic tape 12 spooled onto reels 14 and 16. The cartridge 10 is shown in its parked configuration, which is the configuration assumed when the cartridge 10 is out of its associated tape transport. The tape 12 is wound oxide side in and in the parked configuration passes over tape lifters 18, 20 which support the tape 12 along a path crossing a door covered aperture 22 in the bottom of the cartridge 10. When the cartridge 10 is inserted into an associated recorder, the door covering the aperture 22 is withdrawn, allowing the magnetic head and guides of the associated recorder to enter the cartridge. At that time the tape lifters 18, 20 are withdrawn from contact with the magnetic tape 12 by motion of the plate 25 in the direction of the arrow 23. The magnetic tape 12 then wraps the magnetic head and the tape guides, and the cartridge 10 is

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ready for operation. Included in the cartridge 10 are tight winders 24, 26 for squeegeeing air from the tape as it is wound onto the reels 14, 16. It will be appreciated that when the aperture 22 is covered by its door, and the top cartridge cover is in place, the cartridge 10 is totally enclosed and loose debris in the cartridge 10 will be retained within the cartridge 10.

In the practice of the invention a suitable adhesive material is placed inside the cartridge 10. A convenient material for providing the adhesive surface is the double coated adhesive tape 2 manufactured by the 3M Company, St. Paul, Mn. The adhesive tape 28 may be placed on the walls of the enclosure or on the surfaces, say, of the tight winders 24, 26; the only restriction being that the double coated tape 28 not contact the magnetic tape 12. Referring to Fig. 1b, to insure non-contact between the magnetic tape 12 and the adhesive tape 28 under all conditions, a plastic mesh screen 27 having holes 29 covers the adhesive tape 28. The holes in the mesh screen 27 are approximately .050" squares, and the strands 31 of the mesh are approximately .015" in diameter. The mesh screen 27 is thick enough, i.e. .015", to insure that the thin layer of adhesive on the adhesive tape 28 is well below the exposed surface of the mesh screen 27.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

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What Is Claimed Is:

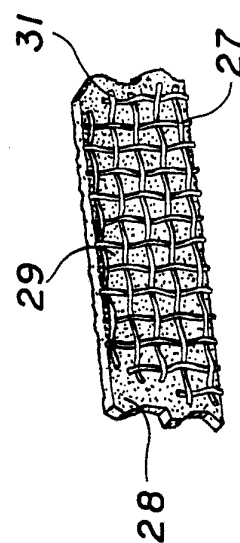
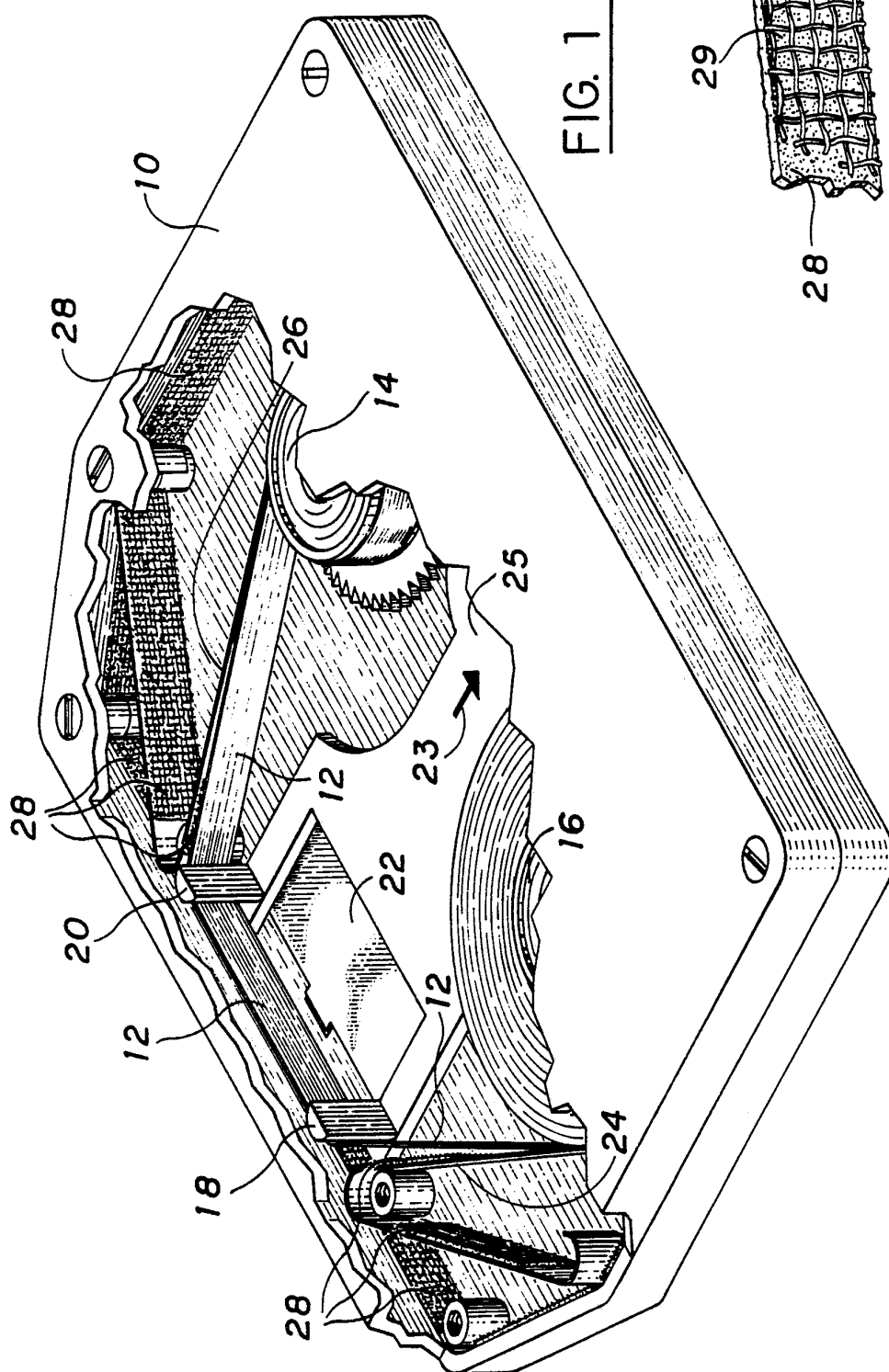
1. An improved enclosable magnetic tape cartridge (10) wherein the improvement comprises an adhesive (28) located within said cartridge whereby
5 debris within said cartridge captured on said adhesive is immobilized.
2. The cartridge of Claim 1 wherein said adhesive is located on at least one interior surface
i said cartridge.
- 10 3. The cartridge of Claim 2 wherein said surface is an interior wall of said cartridge.
4. The cartridge of Claim 2 wherein said adhesive is a double coated adhesive tape.
5. The cartridge of Claim 4 wherein said
15 adhesive is covered with a protective screen mesh (27).

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INTERNATIONAL SEARCH REPORT

International Application No PCT/US 90/06488

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC5: G 11 B 23/50, 23/087																				
II. FIELDS SEARCHED Minimum Documentation Searched⁷ <table style="width: 100%; border: none;"> <tr> <td style="width: 25%; border: none;">Classification System</td> <td style="border: none;">Classification Symbols</td> </tr> <tr> <td style="border: none; height: 40px; vertical-align: bottom;">IPC5</td> <td style="border: none; vertical-align: bottom;">G 11 B</td> </tr> </table> Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched⁸			Classification System	Classification Symbols	IPC5	G 11 B														
Classification System	Classification Symbols																			
IPC5	G 11 B																			
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Category *</th> <th style="width: 60%;">Citation of Document,¹¹ with indication, where appropriate, of the relevant passages¹²</th> <th style="width: 30%;">Relevant to Claim No.¹³</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">X</td> <td style="vertical-align: top;">US, A, 4001892 (V. CASTELLI ET AL) 4 January 1977, see column 2, line 25 - column 4, line 35; figure 1</td> <td style="text-align: center; vertical-align: top;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td style="text-align: center; vertical-align: top;">--</td> <td style="text-align: center; vertical-align: top;">4</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td style="vertical-align: top;">Patent Abstracts of Japan, Vol 11, No 68, P553, abstract of JP 61-230692, publ 1986-10-14 OLYMPUS OPTICAL CO LTD.</td> <td style="text-align: center; vertical-align: top;">1</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td style="vertical-align: top;">US, A, 3765941 (G.S. GORDON) 16 October 1973, see abstract; figure 1</td> <td style="text-align: center; vertical-align: top;">1-4</td> </tr> <tr> <td></td> <td style="text-align: center;">--</td> <td></td> </tr> </tbody> </table>			Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	X	US, A, 4001892 (V. CASTELLI ET AL) 4 January 1977, see column 2, line 25 - column 4, line 35; figure 1	1-3	Y	--	4	Y	Patent Abstracts of Japan, Vol 11, No 68, P553, abstract of JP 61-230692, publ 1986-10-14 OLYMPUS OPTICAL CO LTD.	1	Y	US, A, 3765941 (G.S. GORDON) 16 October 1973, see abstract; figure 1	1-4		--	
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* Special categories of cited documents:¹⁰ "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family																				
IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> Date of the Actual Completion of the International Search 5th March 1991 </td> <td style="width: 50%; border: none; vertical-align: top;"> Date of Mailing of this International Search Report 22. 03. 91 </td> </tr> <tr> <td style="width: 50%; border: none; vertical-align: top;"> International Searching Authority EUROPEAN PATENT OFFICE </td> <td style="width: 50%; border: none; vertical-align: top;"> Signature of Authorized Officer MISS D. S. KOWALCZYK </td> </tr> </table>			Date of the Actual Completion of the International Search 5th March 1991	Date of Mailing of this International Search Report 22. 03. 91	International Searching Authority EUROPEAN PATENT OFFICE	Signature of Authorized Officer MISS D. S. KOWALCZYK														
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III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
A	DE, C1, 3238431 (PHILIPS PATENTVERWALTUNG GMBH) 29 March 1984, see the whole document -- -----	1

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO. PCT/US 90/06488

SA 43145

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on 31/01/91
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4001892	04/01/77	CA-A- 1063725	02/10/79
		DE-A- 2555570	30/09/76
		FR-A-B- 2304979	15/10/76
		GB-A- 1519620	02/08/78
		JP-A- 51111339	01/10/76
		NL-A- 7514958	21/09/76

US-A- 3765941	16/10/73	NONE	

DE-C1- 3238431	29/03/84	NONE	

For more details about this annex : see Official Journal of the European patent Office, No. 12/82