United States Patent

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[54] **BULK DEMAGNETIZER SYSTEM AND METHOD**
24 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** **317/157.5,** 317/262, 179/100.2
[51] **Int. Cl.** **H01f 13/00**
[50] **Field of Search** .... 317/157.5, 157.51, 262; 179/100.2 (D)

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ABSTRACT: A portable bulk demagnetizer having a shaft receiving a reel of magnetic tape which is rotated to move successive radial segments of the tape through an alternating polarity magnetic field, the shaft being progressively moved axially to move the record medium away from the magnetic field source with sufficient uniformity to effectively demagnetize the tape.

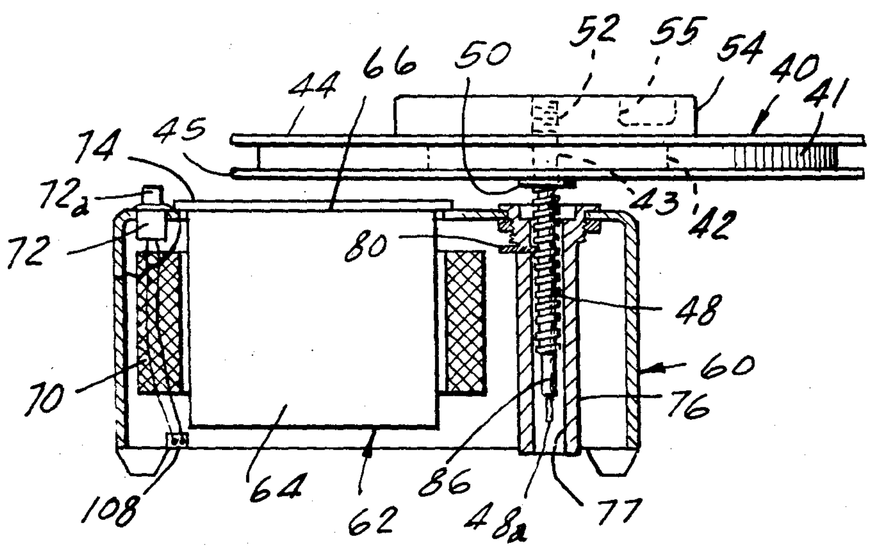

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Fig. 2

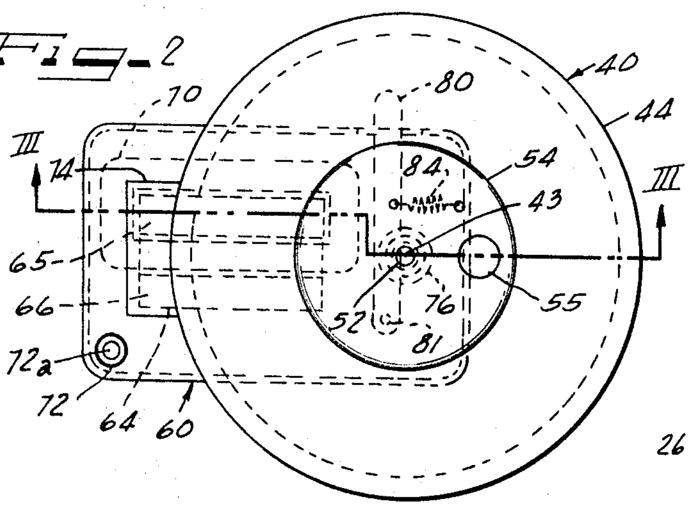


Fig. 1

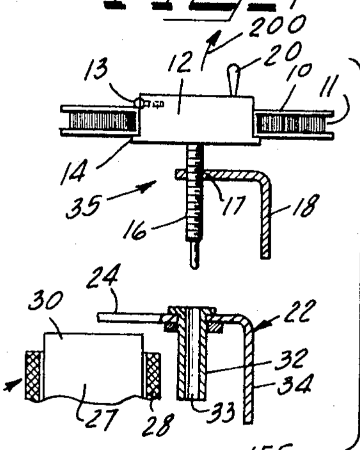
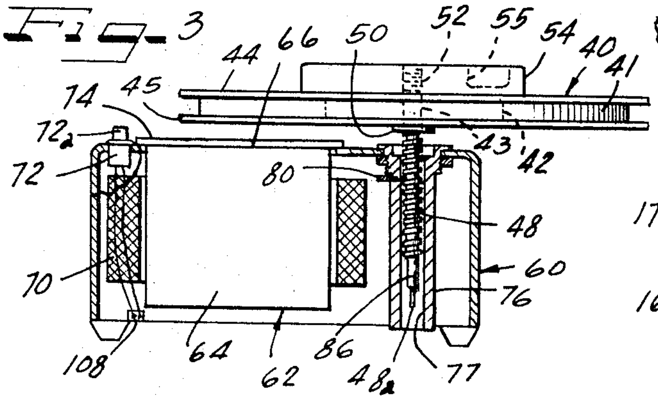


Fig. 3



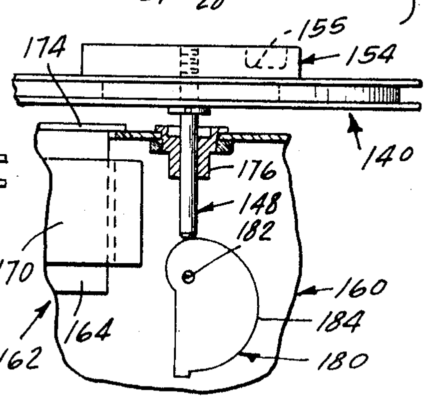
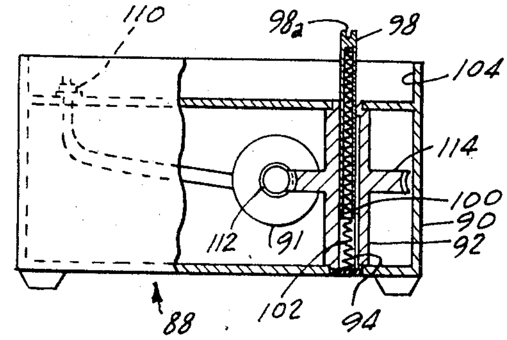
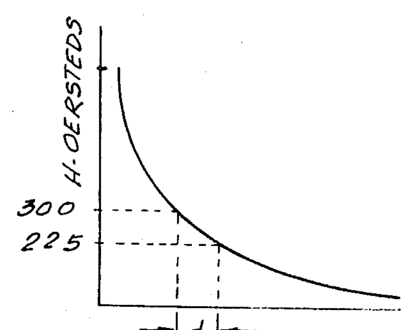


Fig. 5

Fig. 6

Fig. 4





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BULK DEMAGNETIZER SYSTEM AND METHOD

CROSS-REFERENCE TO RELATED APPLICATION

In compliance with the requirement of 35 U.S.C. 120 reference is made to my copending application Ser. No. 456,192 filed May 17, 1965, and the disclosure thereof is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

To bulk erase a reel of tape, heavy and expensive automatic equipment has been necessary. While inexpensive equipment will obliterate a previous recording, it has been found that long wavelength magnetization remains on the tape.

SUMMARY OF THE INVENTION

The present invention teaches that a low cost portable bulk demagnetizer may be constructed which eliminates such long wavelength magnetization providing the reel of tape is moved sufficiently gradually and uniformly through a critical range of magnetic field intensities.

It is therefore an object of the present invention to provide a low cost bulk demagnetizer and method which yet effectively eliminates such long wave length magnetization.

Another object of the invention is to provide a particularly low cost readily portable bulk demagnetizer which is extremely compact.

A further object of the invention is to provide a low cost bulk demagnetizer suitable for quickly and effectively demagnetizing tapes having television recordings thereon.

A still further object of the invention is to provide a portable low cost demagnetizer which duplicates the performance of heavy and expensive automatic equipment.

Other objects, features and advantages of the present invention will be apparent from the following description taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary somewhat diagrammatic vertical sectional view illustrating one form of demagnetizer apparatus in accordance with the present invention,

FIG. 2 is a somewhat diagrammatic plan view of a second form of demagnetizer in accordance with the present invention;

FIG. 3 is a vertical sectional view taken generally along the line III–III of FIG. 2.

FIG. 4 illustrates an optional power drive unit for the apparatus of FIGS. 2 and 3;

FIG. 5 illustrates a further embodiment of the present invention; and

FIG. 6 is a diagram illustrating the variation of magnetic field intensity as a function of distance for the embodiments of the present invention and illustrating by way of example the critical magnetic field region referred to in explaining the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates a first embodiment wherein a reel **10** has a magnetic tape record medium **11** wound thereon which is to be demagnetized. The reel 10 is detachably secured to a hub member **12** having a spring urged detent **13** for securing the reel against a shoulder portion **14**.

The hub member **12** is shown as having a threaded shaft **16** depending therefrom, and which shaft extends through a threaded aperture **17** in a bracket **18**. The hub member **12** is provided with a handle **20** which as hereafter explained is utilized to rotate the reel **10** and threaded shaft **16**.

A mounting means is generally indicated at **22** and comprises a nonmagnetic casing part **24** enclosing an electromagnet **26** including a magnetic core **27** and a winding **28**. A polar face **30** of the core means **27** may have a generally rectangular configuration and may be in vertical alignment with a generally radial segment of the coil of magnetic tape **11** carried by the reel **10**. The mounting means further comprises a bushing **32** for receiving the threaded shaft **16** with sufficient clearance to accommodate rotation of the shaft **16** on its axis of rotation as well as translation of the shaft in the direction of its axis which is vertical as viewed in FIG. 1.

When the threaded shaft **16** is inserted into the bore **33** of bushing **32**, bracket **18** engages sidewall **34** of the mounting means so as to prevent rotation of the bracket **18**. Accordingly, when the handle **20** is manually operated, rotation of the shaft **16** will cause the reel **11** to move progressively away from the electromagnet **26** at a controlled rate which is coordinated with the rate of rotation of the reel.

It is found possible to duplicate the performance of heavy expensive automatic bulk demagnetizing equipment with the apparatus of FIG. 1. A typical unit of automatic equipment weights 90 pounds, draws 23 amps at 117 volts alternating current and erases tape to −70 to −90 decibels below saturated signal level. To achieve comparable results with the inexpensive portable unit of FIG. 1, it is found that the tape must b e moved very slowly through a range of critical filed intensities such as illustrated in FIG. 6 for the case of a magnetic tape having a coercive force of the order of 225 oersteds. For example, the handle **20** may be turned at about one-tenth turn per second in the direction which raises the reel, the slow turning being most necessary while the spool is in the critical filed region. The handle **20** can be turned faster afterward, and when the spool is raised about 2 to 3 inches above the surface of panel **24**, the entire assembly **35** consisting of parts, **12**, **16** and **18** which is coupled to the reel can be grasped and slowly lifted and moved until it is several feet from the electromagnet **26**, after which the electromagnet is deenergized.

In operation of the embodiment of FIG. 1, the threaded shaft **16** is turned relative to bracket **18** until the hub **12** is at the lower initial position, the threaded shaft **16** being inserted into the bushing **32**. The reel **10** is then mounted on the hub **12**, and a suitable switch operated to energize the electromagnet with alternating current. The handle **20** is now turned slowly as the magnetic tape moves through the critical field region illustrated in FIG. 6. When the spool is raised about 2 to 3 inches above the surface of panel **24**, it is grasped and the entire assembly **35** coupled therewith is slowly lifted and moved until several feet from the electromagnet, after which the electromagnet is deenergized.

In FIGS. 2 and 3, a reel **40** has magnetic tape **41** wound thereon which is to be demagnetized. The reel includes a hub portion **42** having a central aperture **43** and a pair of side flanges **44** and **45**. A threaded shaft **48** has a disc **50** for supporting the reel **40** and has a threaded upper end **52** for receiving a suitable reel retainer member **54**. The retainer **54** may be provided with a finger aperture such as indicated at **55** to facilitate manual rotation of the assembly including reel **40**, shaft **48** and retainer **54**.

A casing **60** mounts an electromagnet **62** in alignment with a radial segment of the coil of magnetic tape **41** as in the previous embodiment. The electromagnet includes a generally U shaped magnetic core **64** having pole faces **65** and **66** defining a polar region (including the gap between the pole faces **65** and **66**) which has a dimension radially of the shaft **48** substantially less than the diameter of the reel **40**. A winding **70** is shown encircling one leg of the core. By way of example, the winding may be energized from a 117 volt, 60 hertz source under the control of a pushbutton switch indicated at **72**.

The casing **60** may including a panel member **74** of bakelite or the like which serves to separate the undersurface of the reel **40** from the pole faces **65** and **66**.

A bushing **76** with a smooth bore **77** receives the shaft **48** with sufficient clearance to accommodate rotation and translation. A release lever is indicated at **80** which is pivotally mounted at **81** to the casing **60** and is provided with a tension spring **84** for urging the lever in the clockwise direction relative to pivot **81** as viewed in FIG. 2. This lever is thus normally urged into engagement with shaft **48** to serve as a nut for cooperation with the external thread of shaft **48** while accommodating resetting of the shaft **48** to the lower initial position without requiring rotation thereof during insertion of the shaft into bushing **76**.

The embodiment of FIGS. **2** and **3** may be manually powered by inserting the finger into aperture **55** and rotating the reel **40** and the associated parts **48** and **54** in the direction to gradually raise the reel **40** away from the electromagnet **62**. The shaft **48** may be provided with a smooth lower section **86** to accommodate removal of the reel and the associated parts and displacement to a distance of several feet while the electromagnet remains energized for example by maintaining pushbutton **72a** of switch **72** depressed.

As an alternative, the auxiliary power drive unit **88** of FIG. **4** may be utilized to drive the shaft **48** of the embodiment of FIGS. **2** and **3**. The unit **88** includes a housing **90** having an electric motor **91** which is coupled by means of suitable gearing so as to drive the hollow shaft **92**. The shaft **92** is provided with an internal keyway **94**. A coupling shaft **98** is reciprocally mounted in the bore of shaft **92** and is provided with a key **100** for sliding movement in the keyway **94**. A compression spring **102** urges the shaft **98** upwardly so that the upper end **98a** of the shaft is urged into coupling engagement with the lower end **48a** of threaded shaft **48**, FIG. **3**, when the demagnetizer and drive unit are assembled. Specifically, it will be noted that the housing **90** is provided with a receiving well **104** which is dimensioned to receive the lower portion of the casing **60**. The parts **48a** and **98a** may be provided with any suitable detachable coupling arrangement to enable motor **91** to drive the threaded shaft **48** when the components are in assembled relation. The casing **60** may include a suitable socket **108** and the well **104** may include a plug **110** to provide a convenient means for energizing motor **91** under the control of the pushbutton switch 72.

In operation of the power driven demagnetizer, the reel **40** is secured on the shaft **48** by means of retainer **54** with the shaft **48** at its lowermost initial position. The pushbutton **72a** is then depressed to energize electromagnet **62** and motor **91**, the reel being rotated at a relatively slow rate as in the previous embodiment and slowly raised in a vertical direction. When the threaded portion of shaft **48** has been disengaged from the associated portion of lever **80**, the reel assembly may be grasped and removed by several feet from the electromagnet **62** before the pushbutton **72a** is released to deenergize the electromagnet and the motor.

By way of example, motor **91** may drive a worm shaft **112**, and the hollow shaft **92** may be provided with a worm wheel **114** driven by the shaft **112**. The coupling parts **48a** and **98a** may utilize a Phillips head (crossed slot)-type coupling or other suitable disengageable coupling.

FIG. **5** illustrates an embodiment generally similar to that of FIGS. **2** and **3** wherein a reel **140** is secured to a shaft **148** by means of a retainer **154** having a finger aperture **155**. A casing **160** contains an electromagnet **162** including a magnetic core **164** and a winding **170**. A nonmagnetic panel **174** of casing **160** may overlie the polar faces of magnetic core **164**. Mounting means for the reel assembly comprises a bushing **176** which accommodates rotation and vertical reciprocation of the shaft **148**.

In this embodiment, a cam **180** is mounted for manual rotation on a shaft **182** and is provided with a cam face **184** of progressively increasing radius of curvature. The contour of the cam face **184** is such as to facilitate the gradual raising of the shaft **148** during rotation of the retainer **154**. By way of example, a hand operated crank (not shown) may be utilized to rotate cam **180** at a controlled rate coordinated with the rate of manual rotation of the reel **140** such that the magnetic tape of the reel **140** is completely demagnetized as explained in connection with the preceding embodiments.

The operation and desirable parameters for the embodiments of FIGS. **2**—**5** are the same as those for FIG. **1** except as specifically indicated herein.

An embodiment such as illustrated in FIG. **1**, for example was tested with a seven inch diameter reel of magnetic tape having a television signal recorded thereon. The demagnetizer gave clearly erased tape with no trace of noise or nonuniformity. The erased tape was recorded and the recording played back, after which the tape was erased again. The result was a perfectly clean and uniform tape with a degree of erasure comparable to that obtained with the typical automatic equipment previously referred to herein.

In each of the illustrated embodiments a mounting means is provided (**22**, FIG. **1**, **60**, FIG. **3** and **160**, FIG. **5**) which provides for rotation of the reel about an axis of rotation which is disposed generally parallel to a predetermined direction of decreasing field intensity and providing for relative movement of the reel in a direction of translation generally parallel to the direction of decreasing field intensity. An operating means (parts **16**, **17**, FIG. **1**, parts **48**, **80**, FIG. **3** and parts **148**, **184**, FIG. **5**) mechanically move the reel relatively in the direction of translation during rotation of the reel about the axis of rotation of the reel about the axis of rotation to substantially completely demagnetize the magnetic record medium. The operating means in each embodiment provides for the subjection of the record medium to a magnetic field intensity which gradually diminishes from a value substantially in excess of the coercivity of the record medium to a value somewhat below the coercivity. The term "coercivity" as used herein refers to the coercive force as measured at 60 hertz and with an applied field amplitude corresponding to saturation flux density in the record medium. The term "coercive force" as used herein may be taken as a reasonable approximation of coercivity and refers to a measurement at 60 hertz with an applied magnetizing field amplitude of 1,000 oersteds. Where the coercivity of the record medium is of the order of 225 oersteds, the critical field region would extend from about 300 oersteds to somewhat below 225 oersteds. In the illustrated embodiments, with a 60 hertz alternating polarity magnetic field, the record medium is moved gradually through the critical magnetic field zone from about 300 oersteds to below 225 oersteds over a time interval of at least several seconds. After movement of the record medium through the critical field zone the reel may be removed from the vicinity of the electromagnet in the presence of the alternating polarity magnetic field at a rate of movement which subjects the record medium to a substantially more rapidly diminishing magnetic field intensity.

In each of the embodiments, a mechanical coupling is provided between the operating means and the mounting means to provide mechanically controlled gradual movement of the reel relative to the mounting means in the direction of translation through the critical portion of the magnetic field region such as indicated in FIG. **6**. In FIG. **1**, the operating means **16**, **17** is coupled with the mounting means at **34** by means of the bracket **18**, so that the coupling may be disengaged to accommodate more rapid movement of the reel in the direction of translation. In the embodiments of FIGS. **3** and **5**, the portions **48**, **80** and **148**, **184** of the operating means provide the mechanical coupling with the mounting means and are disengageable to accommodate more rapid movement of the reel.

By way of example of a specific embodiment, the threaded elements **16** and **48** may have a pitch of 32 threads per inch or 16 threads per inch. A rate of rotation of one revolution every 10 seconds or every 5 seconds may be used. The overall dimensions of the demagnetizer case may be 4½ inches wide, 7½ inches long (the horizontal dimension as viewed in FIG. **3**, for example) and 3½ inches high, so that the maximum dimension of the casing is less than about 8 inches. For a seven inch reel fully loaded with magnetic tape, the rate of rotation should not exceed 1 revolution per second during exposure to the critical magnetic field zone. In the illustrated embodiments which provide repeated exposure of a given segment of the tape within the critical field zone, each exposure should involve at least 3 cycles of the alternating polarity magnetic field and preferably at least 4 cycles. In the absence of such repeated exposure within the critical field zone, exposure to at least 5 cycles of the alternating polarity magnetic field within the critical zone is considered preferable.

In each of the embodiments, an alternating polarity magnetic field is established in a magnetic field region which has a decreasing field intensity along a path which is generally vertical in the critical field region but which may typically curve as indicated at **200** in FIG. **1** and still constitute a path with decreasing field intensity along which the assembly **35** may be moved after decoupling thereof from the mounting means. In each of the illustrated embodiments, the reel is rotated during movement in the direction of translation a distance of at least one inch and thereafter the reel is moved a substantially greater distance along the path of decreasing field intensity without rotation thereof in the presence of the alternating polarity magnetic field. In each of the embodiments, the movement of the reel in the direction of translation is coordinated with the rotation of the reel to subject the record medium to a magnetic field intensity which gradually diminishes from a value substantially in excess of the coercivity of the record medium to a value somewhat below the coercivity of the record medium, the reel thereafter being translated through the magnetic field and along the path at a substantially more rapid rate.

For example where the coercivity of the record medium is taken as approximately 225 oersteds, the reel is rotated at a relatively uniform rate during subjection of the record medium to magnetic field intensities which gradually diminish from about 300 oersteds to below 225 oersteds and thereafter the reel is relatively rapidly moved along the path in the presence of the alternating polarity magnetic field.

Each of the embodiments illustrates a mechanical motion reduction means for mounting the elongated magnetic record medium in a compact bulk configuration, the mechanical motion reduction means including a mechanical element such as screw thread **16** or **48**, or cam surface **184** for progressively moving the magnetic record medium in the bulk configuration thereof in a translation direction having a substantial component which is parallel to the direction of decreasing field intensity, for example the vertical motion of the reel being in step with but at a greatly reduced rate in relation to the motion of the operating means such as handle **20**, finger depression **55** or the operating handle for the cam **180**.

It will be apparent that many modifications and variations may be effected without departing from the scope to the novel concepts of the present invention.

I claim:

1. A bulk demagnetizer comprising:

a fixed support having means for establishing in a magnetic field region an alternating polarity magnetic field having a decreasing field intensity along a path in the field region;

said support having means for mounting a tape record medium in a compact annular record medium configuration with a central axis thereof substantially parallel to the path of decreasing field intensity and with the plane of the annular record medium configuration disposed substantially normal to said path; and

operating means for coupling with the mounting means to control the exposure of said annular record medium configuration to said alternating polarity magnetic field in said magnetic field region to effect demagnetization of said record medium, said operating means comprising mechanical means mechanically coupled with said mounting means and operating at a mechanically controlled gradual rate for progressively moving the annular record medium configuration in a direction of translation generally along said path of decreasing field intensity while maintaining the plane of said annular record medium configuration essentially at right angles to said path throughout the demagnetizing operation.

2. A bulk demagnetizer comprising:

a support having a shaft operably associated therewith, and having an electromagnet disposed at one side of said shaft for producing a magnetic erasing field at one sector of the region surrounding said shaft;

said shaft having record medium mounting means for mounting a magnetic record medium in a compact annular configuration, the mounting means mounting the record medium configuration with its central axis coinciding with the axis of said shaft and with the plane of the record medium configuration disposed substantially at right angles to the axis of the shaft, and with a sector only of the record medium configuration being in axial alignment with the electromagnet with respect to a direction parallel to the axis of the shaft; and

operating means providing for rotation of said shaft together with said record medium configuration while maintaining the plane of said record medium configuration at right angles to the axis of said shaft so that successive sectors of the record medium configuration move into axial alignment with said electromagnet for exposure to said magnetic erasing field, and said operating means comprising mechanical means operating at a mechanically controlled gradual rate for progressively reducing the intensity of the magnetic field acting on the successive sectors of said record medium configuration.

3. The demagnetizer of claim **2** with said support having a sleevelike journal constraining said shaft for rotation on its axis and for translation exclusively parallel to said axis, and said mechanical means acting on said shaft to move the shaft at said mechanically controlled gradual rate in the axial direction while constrained by said sleevelike journal to move the record medium configuration progressively away from the electromagnet at said gradual rate as the shaft rotates on its axis in said journal while the plane of the record medium configuration is continuously maintained at right angles to the shaft and with successive sectors of the record medium configuration continuing to move into axial alignment with the electromagnet as the record medium configuration is gradually moved away from the electromagnet.

4. A demagnetizer according to claim **3** with said mechanical means providing for movement of said shaft in the axial direction a distance of the order of one inch so as to move the record medium through a critical field zone sufficiently gradually to insure substantially complete demagnetization of the record medium, said shaft together with the record medium being disengageable from said support by axial movement of the shaft out of said sleevelike journal after movement of the record medium through the critical field zone, whereby the record medium configuration may be manually grasped after movement thereof of through the critical field zone to accommodate manual translation of the shaft and record medium configuration at a substantially more rapid rate in a direction generally away from said electromagnet.

5. The method of demagnetizing a magnetic record medium which comprises:

establishing in a magnetic field region an alternating polarity magnetic field having a decreasing field intensity along a path in the field region;

mounting a reel having the magnetic record medium wound thereon for rotation on an axis of rotation which axis is generally parallel to said path with a radial segment of the magnetic record medium in said magnetic field region; and

rotating the reel on said axis of rotation to move successive radial segments of the record medium into said magnetic field region, mechanically moving the reel progressively in a direction of translation generally along said path while maintaining the plane of the reel essentially at right angles to said path, and coordinating the moving of the reel in said direction of translation with the rotation of the reel to substantially completely demagnetize the magnetic record medium.

6. The method of claim **5** further comprising rotating the reel during movement of the reel in said direction of translation a distance of at least one inch and thereafter moving the reel a substantially greater distance along said path without rotation thereof in the presence of said alternating polarity magnetic field.

7. The method of claim 5 further comprising coordinating the moving of the reel in the direction of translation with the rotation of the reel to subject the record medium to a magnetic field intensity which gradually diminishes from a value substantially in excess of the coercivity of the record medium to a value somewhat below the coercivity of the record medium, and thereafter translating the reel through the magnetic field and along the path at a substantially more rapid rate.

8. The method of claim 5 further comprising rotating the reel at a relatively uniform rate during subjection of the record medium to magnetic field intensities which gradually diminish from about 300 oersteds to below 225 oersteds and thereafter relatively rapidly moving the reel along said path in the presence of said alternating polarity magnetic field.

9. A bulk demagnetizer comprising:

an electromagnet including magnetic core means defining a magnetic field region and winding means coupled to said core means for producing an alternating polarity magnetic field in said magnetic field region having a decreasing field intensity in a predetermined direction;

mounting means for mounting a reel having a magnetic record medium wound thereon which is to be demagnetized and providing for rotation of the reel about an axis of rotation, said axis of rotation being disposed generally parallel to the predetermined direction of decreasing field intensity, and said mounting means providing for relative movement of the reel in a direction of translation generally parallel to said predetermined direction while maintaining the plane of reel substantially at right angles to said predetermined direction;

operating means for mechanically moving the reel relatively in said direction of translation during rotation of said reel about said axis of rotation to substantially completely demagnetize the magnetic record medium wound on said reel; and

said electromagnet being disposed at one side of said axis of rotation and being in alignment with a sector only of a reel mounted on said mounting means, rotation of the reel moving successive sectors of the reel into alignment with the electromagnet throughout the time during which the operating means mechanically moves the reel in said direction of translation, so that the successive sectors of the reel are successively exposed to the alternating polarity magnetic field and so that a given sector of the reel moves into alignment with the electromagnet at successively increased distances in said predetermined direction from the electromagnet.

10. A demagnetizer according to claim 1 with said operating means providing for the subjection of the record medium to a magnetic field intensity which gradually diminishes from a value substantially in excess of the coercivity of the record medium to a value below said coercivity.

11. A demagnetizer according to claim 10 with said operating means serving to gradually diminish the magnetic field intensity acting on the record medium from about 300 oersteds to below 225 oersteds over a time interval of at least several seconds.

12. A demagnetizer according to claim 1 with said operating means providing for the subjection of the record medium to a magnetic field intensity which gradually diminishes from a value substantially in excess of the coercivity of the record medium to a value below said coercivity, and thereafter accommodating removal of said reel from the vicinity of the electromagnet while the electromagnet continues to produce said alternating polarity magnetic field, at a rate of movement which subjects the record medium to a substantially more rapidly diminishing magnetic field intensity.

13. A demagnetizer according to claim 1 with said operating means having a mechanical coupling with said mounting means to provide mechanically controlled gradual movement of the reel relative to said mounting means in said direction of translation through a critical portion of said magnetic field region and said mechanical coupling thereafter being disengageable to accommodate more rapid movement of said reel in said direction of translation.

14. A demagnetizer according to claim 1 with said magnetic core means having a polar region disposed generally radially relative to the axis of rotation of the reel and offset to one side thereof for subjecting successive radial segments of the record medium wound on the reel to said magnetic field as the reel is rotated.

15. A demagnetizer according to claim 1 with said operating means comprising a screw thread for coupling to the reel for rotation therewith and having a pitch to gradually move the reel in said direction of translation as the reel is rotated.

16. A demagnetizer according to claim 15 with said operating means further comprising manually operated means for coupling to said reel to rotate said reel and thereby to rotate said screw thread to progressively move the reel in said direction of translation.

17. A demagnetizer according to claim 15 with said screw thread being engaged with said mounting means to produce gradual movement of the reel through a critical portion of said magnetic field region and thereafter being disengageable from said mounting means to accommodate more rapid movement of the reel in said direction of translation.

18. A demagnetizer according to claim 1 with said mounting means having a power drive for coupling with said reel to rotate the reel at a substantially uniform rate, and said operating means having a mechanical element driven in coordinated relationship with the rotation of said reel to progressively move the reel in said direction of translation.

19. A demagnetizer according to claim 18 with said power drive being detachable from said reel after movement of the reel a first distance in said direction of displacement thereby to accommodate further manual removal of the reel away from said electromagnet in the presence of said alternating polarity magnetic field.

20. A demagnetizer according to claim 1 with an auxiliary power unit for detachable coupling with said operating means to provide for power driving of the said operating means when the power unit is coupled with the operating means, the operating means accommodating manual operation when the power unit is detached therefrom.

21. A demagnetizer according to claim 1 with said operating means comprising a threaded shaft for coupling to said reel during demagnetizing operation, said mounting mean having a power drive for coupling with said threaded shaft to rotate the same in a direction so that the shaft and reel progressively move in said direction of displacement in response to rotation thereof, and means providing for disengagement of the threaded shaft from the power drive after the reel has moved a predetermined distance in said direction of displacement thereby to accommodate further manual removal of the reel away from the electromagnet in the presence of said alternating polarity magnetic field.

22. A demagnetizer according to claim 1 with the demagnetizer being portable, said mounting means including a casing having a panel with a shaft projecting beyond the plane of the panel for receiving the reel, said casing having said electromagnet mounted therein offset to one side of the axis or rotation of said shaft to produce the magnetic field region at the external side of said panel and intersecting a radial segment of the magnetic record medium wound on the reel, the shaft being progressively projected relative to the plane of said panel in response to rotation thereof to progressively move the reel away from the electromagnet.

23. A demagnetizer according to claim 22 with the casing having a maximum dimension which is less than about 8 inches.

24. A demagnetizer according to claim 1 with said operating means comprising a cam coupled with said reel and progressively movable to progressively move said reel in said direction of translation during rotation of the reel.