MAGNETIC SPRING CLIP AND SYSTEM

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ABSTRACT
A magnetic spring clip and system are disclosed. In an embodiment, a magnetic spring clip includes a clip base having a semi-circle shape with an opening for engaging an instrument. The magnetic spring clip also includes a pivot point within the clip base. In addition, the magnetic spring clip includes a shaft having a generally linear shape and upper and lower ends. The upper end of the shaft is attached to the clip base by the pivot point such that the shaft is moveable relative to the clip base. Moreover, the shaft further includes a magnetic lower end. The magnetic lower end is magnetically attracted to the instrument such that the lower end of the shaft contacts the instrument and secures any material between the lower end of the shaft and the instrument. The magnetic spring clip also has a clip magnet, wherein the clip magnet has a magnetic south pole and a magnetic north pole.
MAGNETIC SPRING CLIP AND SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part application of U.S. application Ser. No. 11/208,494 filed on Aug. 22, 2005, which is incorporated by reference herein in its entirety.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not applicable.

BACKGROUND OF THE INVENTION

[0003] 1. Field of the Invention

[0004] This invention relates to the field of securing items and more specifically to a magnetic spring clip and system for securing items to clothing.

[0005] 2. Background of the Invention

[0006] Items such as writing instruments and flashlights have been secured to clothing by clips. For instance, a conventional writing instrument with a clip includes the writing instrument being retractable into an opening of a barrel and having an operating means including an activation button and an operating cam. Drawbacks to conventional clips used with writing instruments include the writing instrument being operated by a single operating means with the clip only functioning when the writing cartridge is retracted.

[0007] Consequently, there is a need for an improved clip and system for securing items such as writing instruments and flashlights to clothing.

BRIEF SUMMARY OF SOME OF THE PREFERRED EMBODIMENTS

[0008] These and other needs in the art are addressed in one embodiment by a magnetic spring clip. In an embodiment, a magnetic spring clip includes a clip base having a semi-circle shape and an opening for engaging an instrument. The magnetic spring clip also includes a pivot point within the clip base. In addition, the magnetic spring clip includes a shaft having a generally linear shape and upper and lower ends. The upper end of the shaft is attached to the clip base by the pivot point such that the shaft is moveable relative to the clip base. The clip further includes a clip magnet having a magnetic north pole and a magnetic south pole.

[0009] These and other needs in the art are further addressed by a magnetic spring clip system. The magnetic spring clip system has a pair of instruments having generally linear shapes, wherein an internal magnet is disposed in one of the instruments. In addition, the magnetic spring clip system includes a magnetic spring clip for attaching the pair of instruments. The magnetic spring clip includes a clip base having a semi-circle shape with an opening for engaging at least one instrument of the pair of instruments. The magnetic spring clip further includes a pivot point within the clip base. Moreover, the magnetic spring clip has a shaft having a generally linear shape and upper and lower ends, wherein the upper end of the shaft is attached to the clip base by the pivot point such that the shaft is moveable relative to the clip base. The shaft further includes a clip magnet. The internal magnet has a magnetic north pole and a magnetic south pole, and wherein the clip magnet has a clip magnet north pole and a clip magnet south pole.

[0010] The foregoing has outlined rather broadly the features and technical advantages of the present invention in order that the detailed description of the invention that follows may be better understood. Additional features and advantages of the invention will be described hereinafter that form the subject of the claims of the invention. It should be appreciated by those skilled in the art that the conception and the specific embodiments disclosed may be readily utilized as a basis for modifying or designing other embodiments for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent embodiments do not depart from the spirit and scope of the invention as set forth in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] For a detailed description of the preferred embodiments of the invention, reference will now be made to the accompanying drawings in which:

[0013] FIG. 1 illustrates a side view of a magnetic spring clip attached to a linear flash light instrument;

[0014] FIG. 2 illustrates an exploded view of the magnetic spring clip;

[0015] FIG. 3 illustrates the magnetic spring clip system with the magnetic spring clip in the closed position;

[0016] FIG. 4 illustrates the magnetic spring clip system with the magnetic spring clip in the open position;

[0017] FIG. 5a illustrates a side view of the magnetic spring clip system;

[0018] FIG. 5b illustrates a side cross-sectional view of the magnetic spring clip system;

[0019] FIG. 6a illustrates a side view of the pivot mechanism of the magnetic spring clip;

[0020] FIG. 6b illustrates a side cross-sectional view of the pivot mechanism of the magnetic spring clip;
FIG. 7 illustrates a side view of an embodiment of the magnetic spring clip system with an illuminated writing instrument;

FIG. 8 illustrates a side view of an alternate embodiment of the magnetic spring clip implemented with an illuminated writing instrument;

FIG. 9 illustrates a side view of an alternate embodiment of the magnetic spring system attached to a dual clip; and

FIG. 10 illustrates the south pole of a clip magnet proximate to a north pole of the magnet in an instrument.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates magnetic spring clip 10 and magnetic spring clip system 100 for securing instruments to a person’s clothing or other objects or devices. FIG. 1 shows an embodiment of magnetic spring clip 10 implemented on instrument 12. As shown, magnetic spring clip 10 is attached to instrument 12. The attachment of magnetic spring clip 10 to instrument 12 produces opening 14 between a portion of magnetic spring clip 10 and instrument 12.

FIG. 2 shows an exploded view of magnetic spring clip system 100. Magnetic spring clip 10 includes clip base 20. Clip base 20 may have a semi-circle design such that an opening exists on one side. This opening enables clip base 20 to receive and attach to instrument 22. Clip base 20 further includes pivot point 24 that attaches clip base 20 to clip arm 26 and enables clip arm 26 to rotate a certain degrees from and toward instrument 22. In some embodiments, clip arm 26 is a shaft. The shaft may have any suitable design for use with magnetic spring clip system 100 such as without limitation a generally linear shape. In some embodiments, clip arm 26 may further have a threaded end away from the pivot point end of clip arm 26. Such a threaded end may provide a means to attach clip magnet 28 to clip arm 26. In other embodiments, clip magnet 28 may be a slide on magnet (e.g., slideably engaged with clip arm 26). In this embodiment, end cap 30 may attach to clip arm 26 via such threads to serve as a magnet stop. Second stop 32 is also positioned on clip arm 26 above clip magnet 28. End cap 30 and second stop 32 help secure and prevent movement of clip magnet 28. It is to be understood that there may be various types of instruments 22 to which magnetic spring clip 10 may be attached such as without limitation generally linearly shaped instruments. One such instrument may be a writing instrument with a magnetic clip as described in U.S. patent application Ser. No. 10/907,734 and another instrument may include a magnetic flash light such as the flashlight disclosed in U.S. patent application Ser. No. 10/908,108, which are both incorporated by reference herein in their entirety.

It is to be understood that magnetic spring clip system 100 as shown in FIG. 2 does not reveal the magnet internal to instrument 22. In one embodiment, clip arm 26 may be of a magnetic material. Further, surface 105 of instrument 22 may also be of a metal or magnetic material. In such embodiment, the magnetic force of clip arm 26 may cause clip arm 26 to be attracted to surface 105 of instrument 22. As shown in FIG. 3, in some embodiments, instrument 12 may contain internal magnet 34 that is aligned such that the magnetic field of internal magnet 34 forms an attraction to the magnetic field of clip magnet 28 on clip arm 26.

FIGS. 3 and 4 conceptually show the different positions of magnetic spring clip system 100. FIG. 3 shows magnetic spring clip system 100 in the closed position. This position is the normal or default position of magnetic spring clip 10. In this position, clip magnet 28 attracts to internal magnet 34. The attraction force (e.g., magnetic attraction) draws clip magnet 28 towards internal magnet 34 and surface 105. In some instances, clip magnet 28 may actually contact surface 105 to provide the clamping action that holds objects inserted into magnetic spring clip system 100 to secure instrument 12 to the desired object.

FIG. 4 shows the position of magnetic spring clip system 100 in the open position. In this position, clip arm 26 is positioned at a distance from instrument 12. However, because of the magnetic attraction between magnetic spring clip 10 and internal magnet 34, a force may be applied to clip arm 26 to overcome the magnetic attraction of clip magnet 28 and internal magnet 34 in order to position clip magnet 28 in the open position. In the open position, material to which it is desired to attach instrument 12 is inserted between instrument surface 105 and clip arm 26. At the release of clip arm 26, the magnetic force may cause clip arm 26 to rotate toward and move clip magnet 28 toward internal magnet 34, thereby clamping the inserted material and securing instrument 12 via magnetic spring clip 10 to the material.

FIG. 5a shows a side view of magnetic spring clip system 100 in the closed position. Magnetic spring clip system 100 shows an embodiment of pivot point 24. Also shown is an illustration of tapered top switch 40. Switch 40 is used to turn on and turn off the light source for a lighting instrument. For a writing instrument, switch 40 may advance and retract the writing element of a writing instrument.

FIG. 5b is a side cross-sectional view of magnetic spring clip system 100. This embodiment is one in which magnetic spring clip 10 is attached to instrument 12, which is in this embodiment a lighting instrument. In addition to the elements of magnetic spring clip system 100, contained within instrument 12 is a pair of batteries 42 and 44. Internal magnet 34 is positioned between batteries 42, 44. At the lower end of instrument 12 is light bulb 46. Switch 40 may be a rotating switch as shown or a push switch. In the implementation of magnetic spring clip system 100 as illustrated in FIG. 5b, internal magnet 34 may not interfere with operation of batteries 42, 44 or electrical functions of instrument 12.

FIG. 6a is a side view of the pivot mechanism of magnetic spring clip 10. In the pivot point mechanism, pivot rod 48 extends through clip arm 26 and attaches to walls 300 of clip base 20. Clip arm 26 may be positioned in clip base 20 to provide greater flexibility and degrees for positioning clip arm 26 in the open position. Extension of portions of clip arm 26 toward switch 40 may restrict the degrees of the opening position. In FIG. 6b, the amount of space 50 between clip base 20 and clip arm 26 also allows for the limited movement of clip arm 26. The closer clip arm 26 is to the top of clip base 20, the smaller the movement of clip arm 26. As shown in FIG. 6b, clip base 20 has walls 300 (e.g., a wall on each side), upper side 305, and opening 310 suitable for receiving clip arm 26 (e.g., shaft).
FIG. 7 is a side view of an embodiment of magnetic spring clip system 100 with instrument 12, which as illustrated is an illuminated writing instrument. In this embodiment, magnetic spring clip system 100 is implemented in an improved illuminated writing instrument 12, which includes writing element 60, lighting element 62 and attaching element 64. Lighting element 62 contains internal magnet 66. Clip magnet 28 magnetically attracts to instrument 12. Writing element 60 and lighting element 62 are secured to each other via attaching element 64. A suitable attaching element is disclosed in U.S. patent application Ser. No. 11/112,260, which is incorporated by reference herein in its entirety. Writing element 60 and lighting element 62 are secured to each other through openings in attaching element 64. Attaching element 64 has an exterior surface formed of elastic grippers that provide increased stability between the user and the writing instrument. Attaching element 64 also has the capability to alter its shape in response to pressure from a user’s fingers. The capability to alter the shape of attaching element 64 enables the user to easily and comfortably hold instrument 12.

FIG. 8 is a side view of an alternate embodiment of magnetic spring clip system 100 implemented with instrument 12, which in this embodiment is an illuminated writing instrument. In this embodiment, magnetic spring clip system 100 is implemented in instrument 12 that includes writing element 80, lighting element 82, and attaching element 84. Writing element 80 and lighting element 82 are secured to each other via attaching element 84, which is disclosed in U.S. Pat. No. 7,101,103. U.S. Pat. No. 7,101,103 is incorporated by reference herein in its entirety. Attaching element 84 is a combination dual clip that attaches writing element 80 and lighting element 82 such that the two elements 80, 82 form one illuminated writing instrument 12. Magnetic spring clip system 100 further includes magnetic spring clip 10 to secure instrument 12 as desired by the user. In operation, the force from the magnetic field of clip magnet 28 attracts to the internal magnet (not illustrated) in lighting element 82. This attraction may draw clip magnet 28 to the internal magnet. The attraction of clip magnet 28 and the internal magnet may secure clip arm 26 to the internal magnet thereby creating the mechanism that may provide the securing capabilities of magnetic spring clip 10. Magnetic spring clip 10 may have the capability of securing instrument 12 as desired by the user. In alternative embodiments (not illustrated), attaching element 84 is a rubber grummet.

FIG. 9 is a side view of an alternate embodiment of magnetic spring clip system 100 attached to attaching element 84, which is a dual clip. Clip base 20 attaches to attaching element 84. In operation, the force from the magnetic field of clip magnet 28 attracts to the internal magnet (not illustrated) in instrument 12. Such attraction may draw clip magnet 28 to the internal magnet. In this embodiment, clip arm 26 extends over attaching element 84.

FIG. 10 illustrates clip magnet 28 and internal magnet 34, which are each magnetized to have north and south poles. In an embodiment, internal magnet 34 has north pole 200 and south pole 205, and clip magnet 28 has clip magnet north pole 210 and clip magnet south pole 215. Internal magnet 34 is rotatable about its longitudinal axis within instrument 12 but is substantially fixed about the longitudinal axis of instrument 12. In such an embodiment, clip magnet 28 is not rotatable about its longitudinal axis but has instead been attached to magnetic spring clip 10 with clip magnet north pole 210 distal to instrument 12 and clip magnet south pole 215 proximate to instrument 12. In such an embodiment, when magnetic spring clip 10 is in the closed position as shown in FIG. 10, the magnetic attraction of clip magnet south pole 215 attracts north pole 200, and internal magnet 34 rotates about its longitudinal axis until north pole 200 is proximate to clip magnet south pole 215. Therefore, north pole 200 is distal to the body of the individual, for instance when instrument 12 is placed in a pocket of the individual and secured to the pocket by magnetic spring clip 10. Without being limited by theory, placing north pole 200 distal to the individual’s body may prevent detrimental health issues to the individual that may be related to magnetic fields. For example, without being limited by theory, placing north pole 200 proximate to the individual’s body may restrict blood flow in vessels exposed to the magnetic field exerted by north pole 200, which may be a detrimental health effect. Such restriction may not occur with south pole 205 proximate to the body. In alternative embodiments, internal magnet 34 is not longitudinally rotatable but is instead fixed in position within instrument 12, with north pole 200 proximate to clip magnet south pole 215. In alternative embodiments (not illustrated), magnetic spring clip 10 further includes a shield. The shield may be composed of any material suitable for shielding a magnetic field. Without limitation, an example of such material is ferrous metal. The shield is disposed about a portion of the outside of clip magnet 28. In an embodiment, the shield is disposed about a portion of the outside of clip magnet 28 that does not include the portion of clip magnet 28 that is in contact with instrument 12 when clip magnet 28 is in the closed position. The shield may be disposed about the outside of clip magnet 28 by any suitable method. For instance, the shield may be applied as a coating, manufactured to be disposed about the outside of clip magnet 28, and the like. In such embodiments, the shield may provide a shield against at least a portion of the magnetic field of both clip magnet 28 and internal magnet 34. In some embodiments, instrument 12 may also include such a shield about a portion of surface 105. In such embodiments, the shield may be exposed at least a portion or substantially all of the portion of surface 105 that is a contact point with clip magnet 28. In embodiments, the shield may provide a shield against at least a portion of the magnetic field of both clip magnet 28 and internal magnet 34.

Although the present invention and its advantages have been described in detail, it should be understood that various changes, substitutions and alterations may be made herein without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A magnetic spring clip, comprising:
   a clip base having a semi-circle shape with an opening for engaging an instrument;
   a pivot point within the clip base;
   a shaft having a generally linear shape and upper and lower ends, wherein the upper end of the shaft is attached to the clip base by the pivot point such that the shaft is moveable relative to the clip base, and
a clip magnet, wherein the clip magnet has a magnetic south pole and a magnetic north pole.

2. The magnetic spring clip as described in claim 1 wherein the clip magnet is disposed on the lower end.

3. The magnetic spring clip as described in claim 1 wherein the clip magnet is screwedly secured to the shaft.

4. The magnetic spring clip as described in claim 1 wherein the clip magnet is slideably engaged to the shaft.

5. The magnetic spring clip as described in claim 1 further comprising upper and lower caps attached to the shaft and positioned such that the clip magnet is disposed between the upper and lower caps.

6. The magnetic spring clip as described in claim 1 wherein the clip base has walls, an upper side and an opening to receive the shaft.

7. The magnetic spring clip as described in claim 6 wherein the clip base further comprises a pivot rod extending across the opening and attached to the walls of the clip base.

8. The magnetic spring clip as described in claim 7 wherein the pivot rod extends through the upper end of the shaft thereby attaching the shaft to the clip base.

9. A magnetic spring clip system, comprising:

   an instrument having a generally linear shape, wherein an internal magnet is disposed within the instrument;

   a magnetic spring clip, comprising:

   a clip base having a semi-circle shape with an opening for engaging the instrument;

   a pivot point within the clip base;

   a shaft having a generally linear shape and upper and lower ends, wherein the upper end of the shaft is attached to the clip base by the pivot point such that the shaft is moveable relative to the clip base, and wherein the shaft further comprises a clip magnet, and

   wherein the internal magnet has a magnetic north pole and a magnetic south pole, and wherein the clip magnet has a clip magnet north pole and a clip magnet south pole.

10. The magnetic spring clip system as described in claim 9 further comprising a second instrument having a generally linear shape.

11. The magnetic spring clip system as described in claim 10 further comprising a mechanism that attaches the instrument to the second instrument.

12. The magnetic spring clip system as described in claim 11 wherein the mechanism is a dual clip or a rubber grummet.

13. The magnetic spring clip system as described in claim 9 wherein the clip magnet further comprises a shield.

14. The magnetic spring clip system as described in claim 9 wherein the north pole of the internal magnet is proximate to the clip magnet south pole.

15. The magnetic spring clip system as described in claim 9 wherein the clip magnet is rotatable about its longitudinal axis.

16. The magnetic spring clip system as described in claim 9 wherein the clip magnet north pole is distal to the instrument.

17. A magnetic spring clip system, comprising:

   a pair of instruments having generally linear shapes, wherein an internal magnet is disposed in one of the instruments;

   a magnetic spring clip for attaching the pair of instruments, wherein the magnetic spring clip comprises:

   a clip base having a semi-circle shape with an opening for engaging at least one instrument of the pair of instruments;

   a pivot point within the clip base; and

   a shaft having a generally linear shape and upper and lower ends, wherein the upper end of the shaft is attached to the clip base by the pivot point such that the shaft is moveable relative to the clip base, and wherein the shaft further comprises a clip magnet; and

   wherein the internal magnet has a magnetic north pole and a magnetic south pole; and wherein the clip magnet has a clip magnet north pole and a clip magnet south pole.

18. The magnetic spring clip system as described in claim 17 wherein the clip magnet further comprises a shield.

19. The magnetic spring clip system as described in claim 17 wherein the north pole of the internal magnet is proximate to the clip magnet south pole.

20. The magnetic spring clip system as described in claim 17 wherein the clip magnet is rotatable about its longitudinal axis.