United States Patent [19]

Kobayashi

[11] 3,831,986

[45] Aug. 27, 1974

[54] CONTAINER HAVING MAGNETIC AND LATCH FASTENING MEANS

[76] Inventor: Sanzo Kobayashi, No. 34-9, Ryusen 3-chome, Tokyo, Japan 110

[22] Filed: Aug. 9, 1972

[21] Appl. No.: 279,182

[52] U.S. Cl. ..... 292/201, 292/251.5, 70/276, 220/55 K

[51] Int. Cl. E05c 3/06

[58] Field of Search ..... 220/55 K; 206/DIG. 33; 292/144, 20 D, 251.5; 70/276

[56] References Cited

UNITED STATES PATENTS

2,730,392	1/1956	Thiebaud	70/276 X
3,095,723	7/1963	McKnight et al.	70/276 X
3,744,833	7/1973	Berducone	292/251.5

Primary Examiner—George T. Hall

Attorney, Agent, or Firm—McGlew and Tuttle

[57] ABSTRACT

A container such as a pencil case comprises a bottom tray and a cover which is engagable over the tray and which is advantageously pivotally connected to one side thereof and is positionable in a closed position in which an eyelet portion of a latching mechanism is engaged within a receiving opening of a hollow space in which a latch member is pivotally mounted. The device includes magnetically operable latch means for locking the cover into position closing the tray and which includes the eyelet on one of the parts, e.g., the cover and a hook mounted in a recess of the other part, i.e., the bottom portion. Spring means are associated with the latch for biasing it toward one of the operating positions, e.g., a latched or closed position and a magnet is employed which may be inserted into a receiving recess of the case for moving the latch to the other of the positions, e.g. an open position. The cover advantageously includes an additional magnet for holding a plate secured on the cover part in a magnetically closed position. The container advantageously includes an outer cover wall part covering at least some of the inner walls thereof and the top or lid is hinged to the outer portion of the double wall of the part.

8 Claims, 5 Drawing Figures

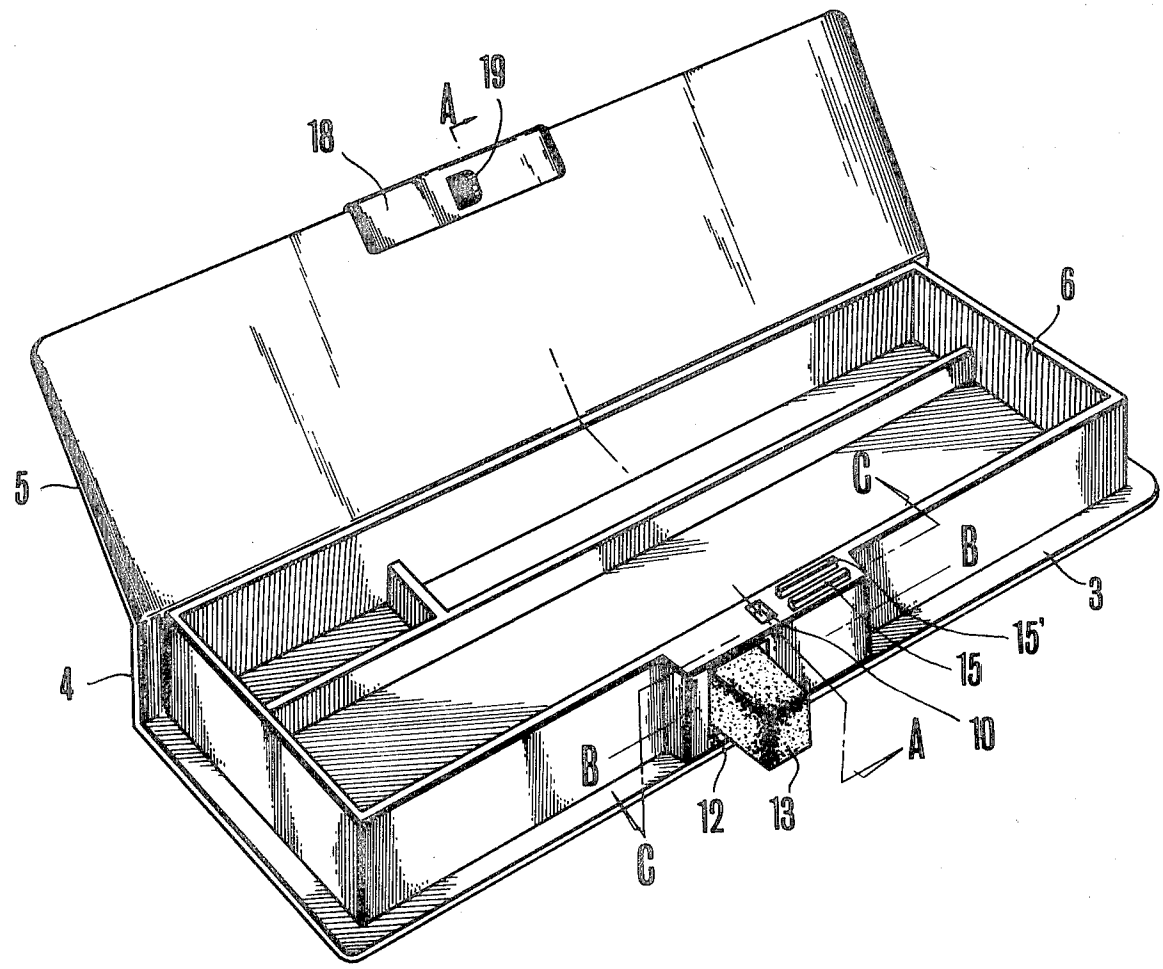


FIG. 1

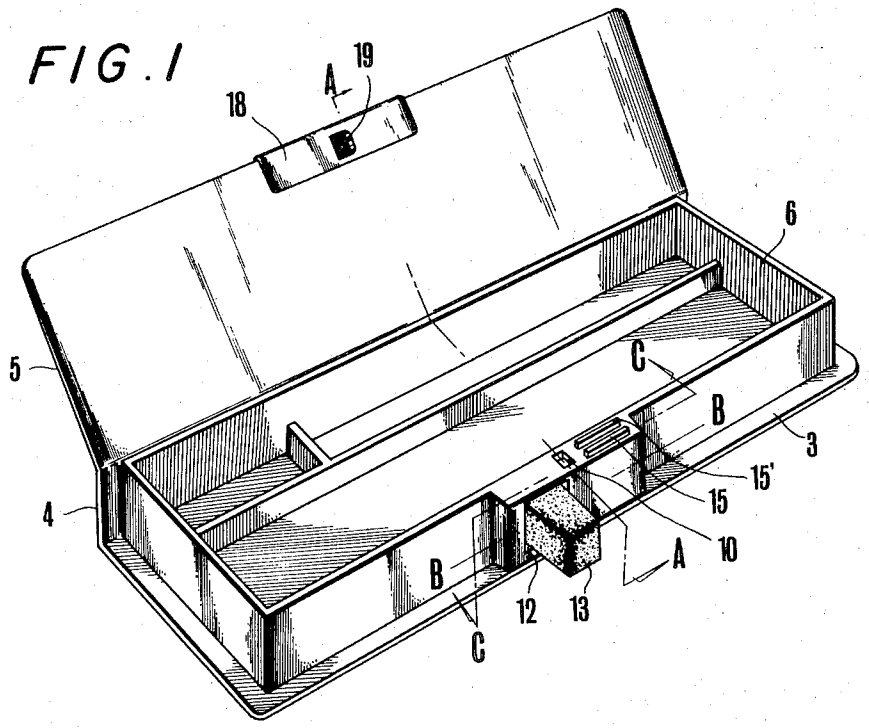


FIG. 2

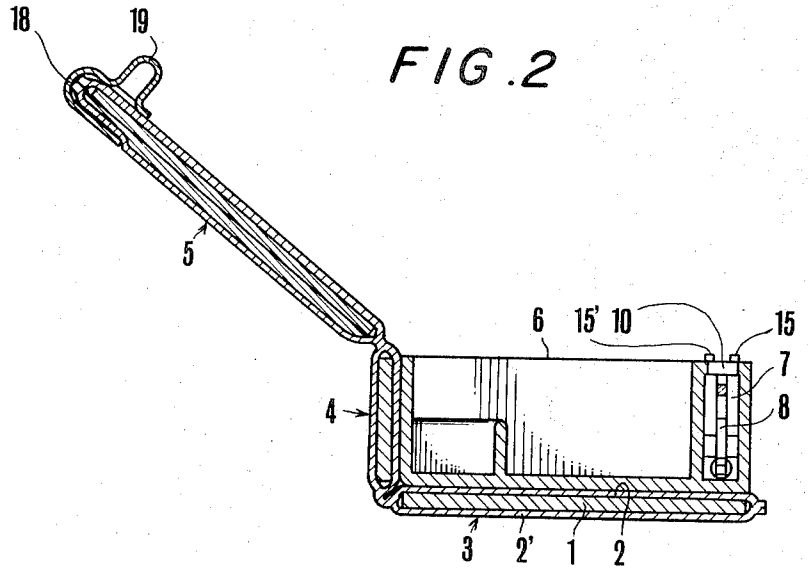


FIG. 3

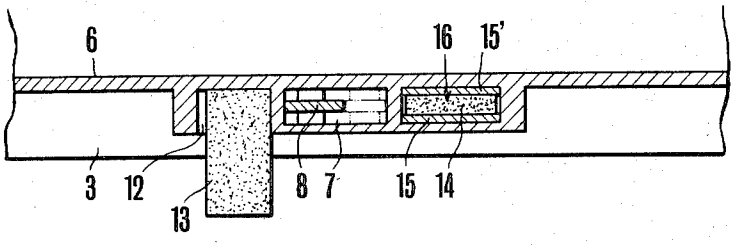


FIG. 4

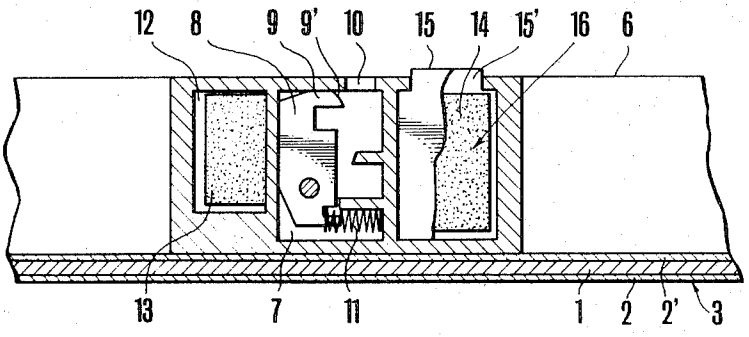
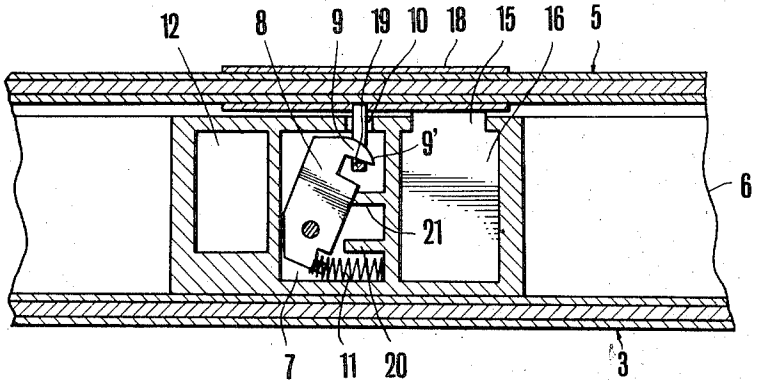


FIG. 5



CONTAINER HAVING MAGNETIC AND LATCH FASTENING MEANS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates in general to the construction of containers and, in particular, to a new and useful container such as a pencil case which has a new and useful magnetically operable latching mechanism for holding the cover in a closed position and for latching it in a closed position and for releasing the cover.

2. Description of the Prior Art

The present invention particularly relates to a novel construction of a locking or latching mechanism for a small case such as a pencil case. Prior to the present invention it was usual to have a relatively inexpensive and unsatisfactory lock on such small containers, particularly containers of a type which are made to see at relatively low prices. A disadvantage of the known constructions is that they were unreliable and in many instances difficult to operate with the keys or other devices provided for their operation.

SUMMARY OF THE INVENTION

In accordance with the present invention there is provided a container which has a bottom tray portion which is closed by a cover which is advantageously hinged at one side of the bottom portion, and which may be pivoted downwardly into a closed position. The invention provides an improved magnetically operable lock for such containers for interengaging latching parts of the bottom tray with the cover in order to lock the cover into position. For this purpose one of the parts, e.g., the bottom part, is provided with a recess to accommodate a magnet which may be inserted into or removed from the part. When the magnet is inserted into position it overcomes the force of a latch biasing spring and urges a latch member, e.g., into an open position at which it releases an eyelet or hook carried on a cover part. When the cover is to be closed it is pivoted so as to move it downwardly toward the bottom tray part and the projecting eyelet thereof enters through the opening of the bottom part and displaces the latch member against the biasing force of its associated spring until it moves beyond the top of the hook portion of the latch and engages behind the hook which is then biased into latching engagement by the spring. The container cannot be opened so long as the magnet is not in position but when it is inserted into a recess alongside of the movable latch, the latch is moved by magnetic attraction to overcome the force of the spring and to release the eyelet. The cover may also be held in a closed position by an additional magnet which attracts a portion of the cover downwardly, but this force may be easily overcome by lifting the cover upwardly.

Accordingly it is an object of the invention to provide an inexpensive case which includes a magnetically operable latching mechanism.

A further object of the invention is to provide a magnetic case which includes a bottom tray portion and a cover pivotal to the tray portion which may be moved into a closed position and which includes a depending eyelet or hook which is engagable into a receiving recess of the tray member in which there is a pivotal latch and wherein the latch is biased by a spring into a latching engagement with the eyelet; and also including a magnet associated with the tray portion which may be moved to a position to magnetically attract the latch and overcome the force of the biasing spring to open it.

A further object of the invention is to provide an inexpensive pencil case and the like which is simple in design, rugged in construction and economical to manufacture.

For an understanding of the principles of the invention, reference is made to the following description of typical embodiments thereof as illustrated in the accompanying drawing.

In the accompanying drawings the example of a container in the present invention is shown.

FIG. 1 is the perspective view of the container as a whole in the present invention.

FIG. 2 is the sectional view along the A—A line in FIG. 1

FIG. 3 is the sectional view along the B—B line in FIG. 1.

FIG. 4 is the sectional view along the C—C line in FIG. 1.

FIG. 5 shows the view of the container covered with the lid in FIG. 4.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings in particular in the invention embodied therein comprises an inexpensive case such as a pencil case which includes a bottom tray portion 6 and a top cover 5 which is hinged at one side of the tray portion and which may be pivoted between an opened position and a closed position.

In accordance with the invention one of the tray and cover parts, e.g. the cover 5 carries a projecting hook or eyelet 19 which is engagable through a receiving opening 10 defined in a widened central portion of the bottom front wall of the bottom tray 6. The opening 10 leads into a hollow space or recess 7 in which there is mounted a pivotal latch member 8 to rotate into a direction in which the hook portion 9 engages with the eyelet 19. The widened area in the central portion of the tray 7 also includes a recess 12 for accommodating a magnet 13 which is capable of attracting the material of the latch 8 and is large enough in attracting force to overcome the biasing of the spring 11 in order to move the latch member 8 to the position shown in FIG. 5, to the position shown in FIG. 4. When the latch 8 is in that position, the eyelet may be removed upwardly through the opening 10. As soon as the magnet 13 is removed again, however, the latch will again go back to the position indicated in FIG. 5. Lid 5 may nevertheless be closed when the latch is in the position of FIG. 5 by directing the eyelet 19 through the opening to engage against the curved top portion of the hook 9 to force the latch backwardly and to permit the eyelet to engage into the recessed portion of the hook.

In the example of the container in the present invention shown in the drawings, the base plate (3), the back plate (4) and the lid plate (5) are formed by pasting the thermoplastic soft synthetic resin sheets (2) (2') to a core plate (1). The container bottom part (6) is made of thermoplastic hard synthetic resin and is fixed on the surface of the base plate (3). A hollow area(7) is formed on the front wall of said container bottom part(6), and a latch(8) made of iron being is provided

on the inside of the hollow area(7) with its intermediate point freely rotatably supported on its rotation. The latch 8 includes a hook member or hook part (a) being made to be accessible to the underside of the hole(10) provided to the upper wall of the hollow area(7). The upper edge of said hook member(9) is given a restoring power and is biased to a closed portion and accessible position; a coil spring(11) which is located between the side-walls of the base area and the hollow area(7) of the container bottom(6).

A magnetic actuating member(13) is engagable with a recess or indentation(12) and made to freely contact or approach the outside of the side-wall of the hollow area(7) opposite the back edge of the hook member(9) of said hook piece(8) to attract it by a force to overcome the biasing of the spring 11 period.

An attracting device(16) consisting of the permanent magnet(14) provided with the pole pieces(15)(15') on both sides is located on the opposite side of the hollow area(7) an iron plate 18 which is subject to attraction is provided on the cover or lid(5) in order to be freely attracted by said pole pieces(15)(15') and to urge the cover into a closed position.

An eyelet or U-shaped locking piece(19) is carried on the cover 5 and is secured to the plate(18). The eyelet(19) is made to be accessible to the range of said hook member(9) when it is moved directly through the hole(10) and when the magnetic member(13) is engaged with the indentation(12). The latch 8 may also be engaged indirectly by contacting with the eyelet 19 the upper slopewise edge (9') of the hook portion(9) through the hole(10) and temporarily pushing away said hook member(9) when the magnetic member(13) is disengaged with the indentation(12). When the lid(5) is closed with the magnetic member(13) disengaged with the indentation(12) the place(18) is attracted by the pole pieces(15(15')and at the same time the locking piece(19) pushes away the hook member(9) and then engages each other to make it impossible to open the lid(5). When the magnetic member(13) is engaged with the indentation (12) and the lock between the hook piece(19) and hook member(9) is released as shown in FIG. 4, the lid(5) can be opened by sliding the lid(5) in the direction of opening against the attraction of the pole pieces(15)(15'). Moreover, the lid(5) can also be opened or closed by making the magnetic member (13) engage or disengage with the indentation(12), that is , by releasing the plate(18) from the pole pieces(15)(15').

As shown in the example described above, the locking member provided to the lid can be engaged or disengaged with the hook piece by making the magnetic member contact or approach or removed from the outside of the side-wall of the hollow area opposite the back edge of the hook member of the hook piece, so that the locking and releasing of the lid can be performed easily and exactly. The present invention in particular has superior merits in its simple mechanism having few troubles when compared with well-known types utilizing the magnetic attraction.

What is claimed is:

1. A container characterized by a bottom portion having side walls with a hollow area with a top hole accessible from the top of said bottom portion and a top cover overlying said bottom portion, a hook piece made of magnetic material being freely rotatably supported on its axis in the hollow area of said bottom portion and being freely accessible to the underside of the hole, an elastic member biasing said hook piece to a restoring position, a magnetic member located in said side walls in a position adjacent the back edge of said hook piece, and a locking member carried by said cover alignable with the hole and which is accessible to the range of the hook piece through said hole when the container is closed, said hook piece having a hook portion engageable into said locking member to lock the container.

2. A container, comprising a bottom tray part and a cover part engagable over said tray, and magnetically operable latch means for locking said cover in a position closing said tray including a projecting eyelet an eyelet on one of said tray and cover parts and a latch pivotally mounted on the other said tray and cover parts, said latch having a hook portion engageable into said eyelet to lock said parts in a closed position, said latch hook portion being pivotal away from the closed position to a fully opened position in which it clears the eyelet and releases it to permit opening of said cover, spring biasing means urging said latch hook portion toward one of said closed and opened positions, and magnetic attraction means stronger than said spring biasing means urging said latch hook portion toward the other of said opened and closed positions.

3. A container according to claim **1**, wherein said tray part comprises upstanding front and side walls, said cover being pivotally connected to the upper end of one of said side walls and having said eyelet, the other of said side walls having a recess containing said latch.

4. A container according to claim **3**, wherein said tray includes at least some walls of a solid plastic inner layer with an outer layer of a double wall plastic formation with a core therebetween, said cover being formed as a portion of said outer layer.

5. A container according to claim **2**, wherein said bottom tray part comprises a substantially rectangular tray having a side wall with a recess portion having an opening at the top thereof, said latch being pivotally mounted within said recess portion below the opening, said cover having said eyelet being engagable over said side wall to cause the eyelet to move into said opening and engage with said latch, said cover including a recess adjacent said latch for accommodating said magnetic attraction means.

6. A container according to claim **5**, wherein said magnetic attraction means comprises a permanent magnet said cover having a front wall with a widened portion defining said recess for said latch and a second recess alongside said recess for accommodating said permanent magnet.

7. A container comprising a bottom tray having end, and side walls and a bottom, a cover pivoted to one of said side walls and being movable to a closed position in which it overlies the other of said side walls, the other of said side walls having a top surface with an opening and being hollow below said opening, a latch member pivoted on said cover side wall in said hollow and having a hook portion disposed below said opening, said cover having a projecting loop member aligned with the opening and being engagable over said latch to displace said latch, spring means biasing said latch to rotate to a position in which it is urged toward alignment with said opening, and a magnet carried in said side wall for attracting said latch against said bias-

ing means to release said hook portion from said loop member to permit opening of said cover.

8. A container according to claim 7, including a magnetically attractable plate carried on said cover and a holding magnet carried on said tray portion in alignment with said plate for holding said cover in a closed position.

* * * * *