

Aug. 14, 1962

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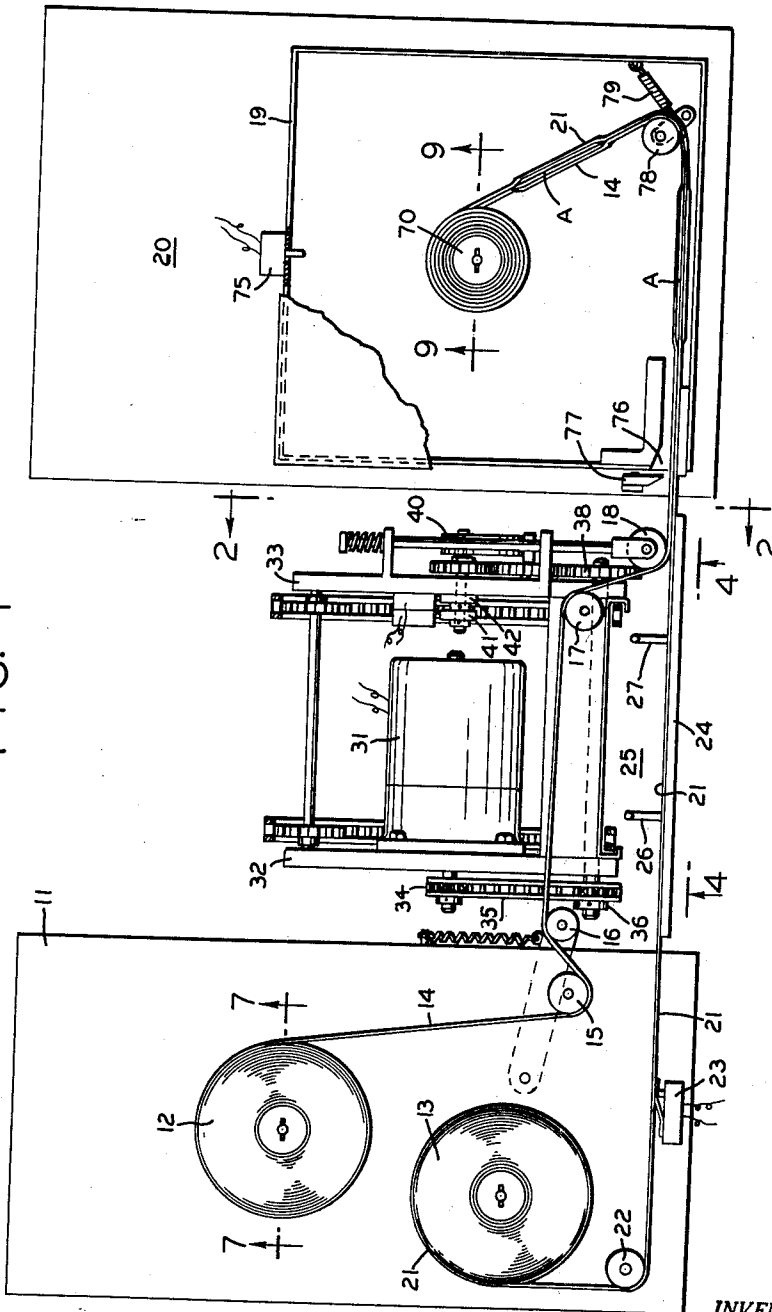
3,049,312

RECEPTACLE FOR DEPOSITORY APPARATUS

Original Filed Dec. 22, 1958

4 Sheets-Sheet 1

FIG. 1



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FIG. 2

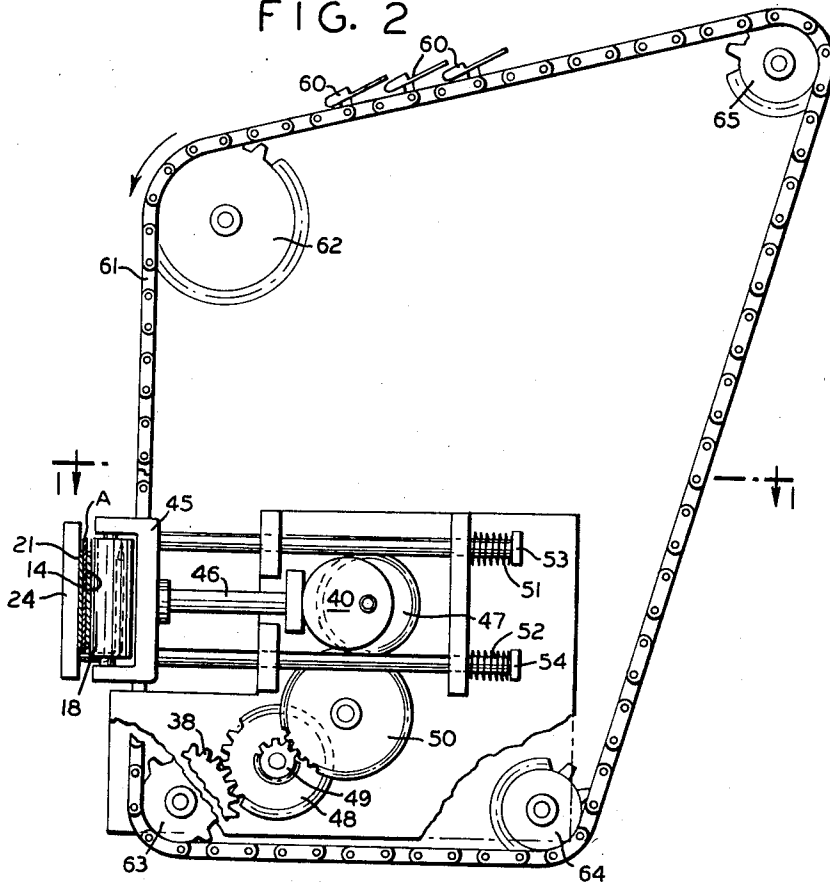
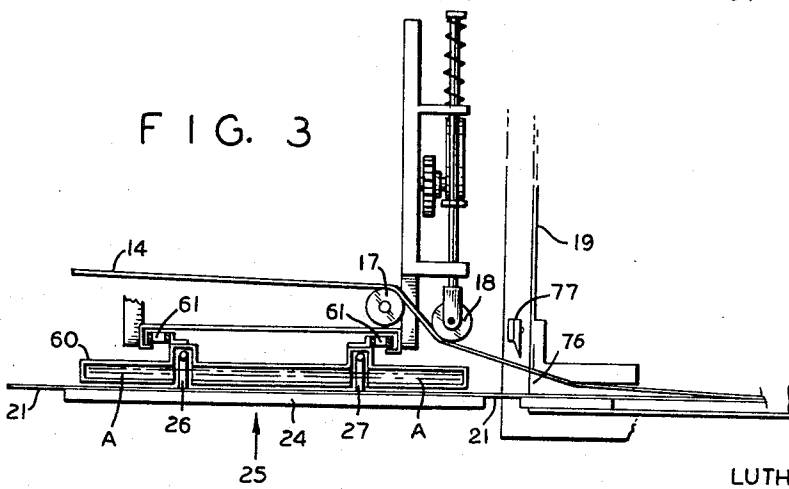


FIG. 3



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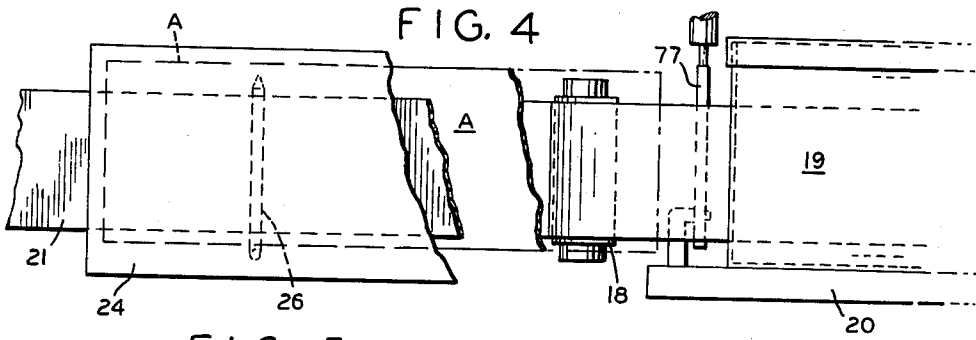


FIG. 4

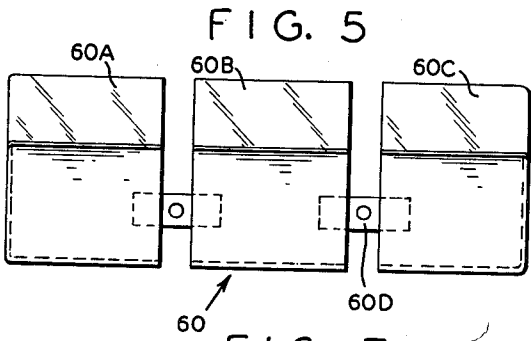


FIG. 5

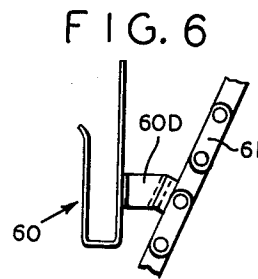


FIG. 6

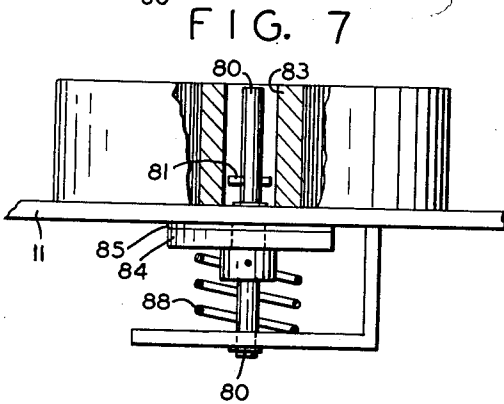


FIG. 7

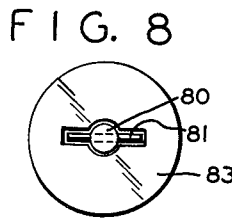


FIG. 8

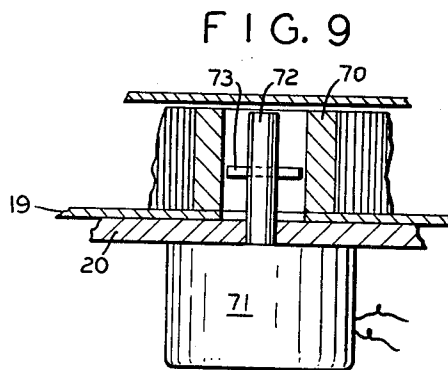


FIG. 9

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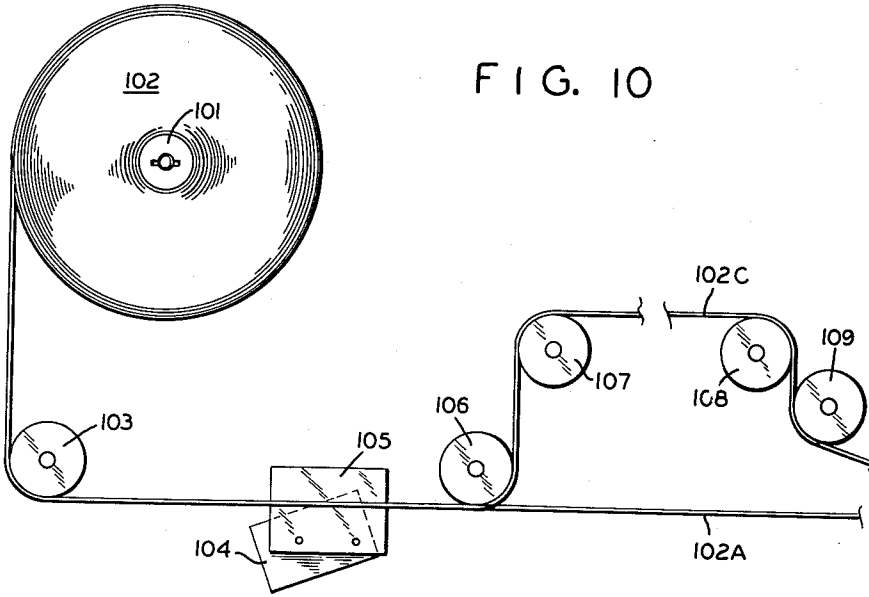


FIG. 10

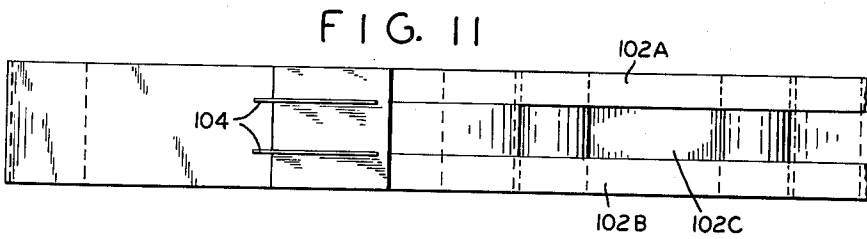


FIG. 11

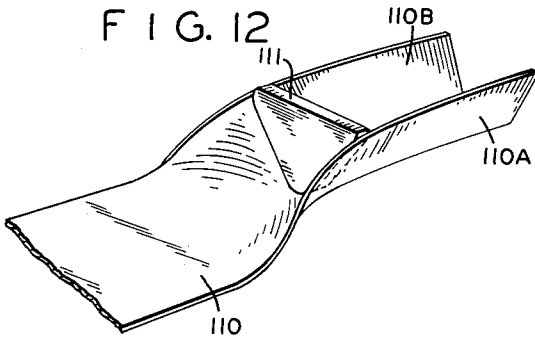


FIG. 12

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RECEPTACLE FOR DEPOSITORY APPARATUS

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Original application Dec. 22, 1958, Ser. No. 782,177, now Patent No. 2,971,303, dated Feb. 14, 1961. Divided and this application Aug. 15, 1960, Ser. No. 49,499

3 Claims. (Cl. 242—56.1)

This application is a divisional application of copending application for U.S. Letters Patent, Serial No. 782,177, entitled "Method and Apparatus for Compartmentizing and Storing an Article," filed December 22, 1958, now U.S. Patent No. 2,971,303, dated February 14, 1961.

This invention is related also to an improved method for compartmentizing a plurality of individual articles to effect a unitary deposit as disclosed in my copending application for U.S. Letters Patent Serial No. 693,986 entitled "Depository Machine Combined With Camera Means," filed November 1, 1957, now U.S. Patent No. 2,936,684 issued May 17, 1960.

In connection with depository devices of the type disclosed in the application referenced, it is necessary not only to provide means for receiving one or more individual articles but also to store these articles for deposit in a distinct and separate manner from a succeeding deposit. Although this task may be accomplished for instance by the use of a compartmentized receptacle into which the single article or a plurality of articles is inserted, I have found that great simplification can be achieved by providing covering material in the form of a strip or in other suitable shape to effect compartmentization.

One of the objects of this invention is therefore, the provision of an improved and novel receptacle for a depository apparatus.

Another object of this invention is the provision of a depository receptacle adapted to receive tape material which acts as a carrier for deposits.

Another object of this invention is the provision of a receptacle which is provided with a roller, the latter being adapted to have a pair of superposed tapes wound about its circumference and the receptacle including also a tension roller for engaging the tape, the tension roller causing the pair of tapes to be taut and forced in a direction toward the receptacle.

A further object of this invention is the provision of a substantially enclosed receptacle which is provided with an aperture through which a pair of tape enters the receptacle, a roller in the receptacle about which the pair of tapes is wound for storage, a tension roller for engaging at least one of the tapes along the path from the aperture toward the storage roller, and a severing means disposed in proximity to the receptacle aperture for cutting the tapes whereby the tension roller causes the severed ends to be pulled through the aperture into the receptacle for concealing the respective ends.

Further and still other objects of this invention will be apparent by reference to the following specification taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a plan view, partly in section, along lines 1—1 of FIGURE 2;

FIGURE 2 is an elevational view, partly in section, along lines 2—2 of FIGURE 1;

FIGURE 3 is a plan view showing in an enlarged scale certain portions appearing in FIGURE 1;

FIGURE 4 is an elevational view, partly in section, of certain details as viewed along lines 4—4 in FIGURE 1;

FIGURE 5 is a close-up view of an article supporting means visible in FIGURE 2;

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FIGURE 6 is a side view of the article supporting means shown in FIGURE 5;

FIGURE 7 is an elevational view, partly in section, along lines 7—7 of FIGURE 1;

FIGURE 8 is a top view of FIGURE 7;

FIGURE 9 is an elevational view, partly in section, along lines 9—9 of FIGURE 1;

FIGURE 10 is a plan view of an alternate arrangement for providing strip material;

FIGURE 11 is a plan view of the strip material obtained by the means shown in FIGURE 10, and

FIGURE 12 is a perspective view, illustrating another method for providing suitable strip material.

Referring now to the figures and FIGURE 1 in particular, numeral 11 identifies a base plate on which there is supported a pair of rolls of strip material, numerals 12 and 13. This strip material may comprise flexible paper tape, banding material, filament tape, ribbon material, wire, or other suitable material which is adapted to partially or wholly cover articles and which is adapted to retain and compartmentize a single or a plurality of articles. Tape 14 being unwound from roll 12 is fed about a fixed roller 15, a resiliently biased roller 16, over a fixed roller 17, and in contact with a reciprocating roller 18 to a storage receptacle 19, the latter being mounted on a support plate 20. Tape 21, being unwound from the roll of tape 13, is fed over a fixed roller 22 along an electrical sensing switch 23, along the inner face of a pressure plate 24 to storage receptacle 19.

It will be observed that tapes 14 and 21 are spaced from one another at an area opposite the pressure plate 24 and this area, numeral 25, will be referred hereinafter as an article insertion station, as will be more clearly understood during the ensuing description.

Pressure plate 24 is equipped on its side with a set of protruding L-shaped brackets, numerals 26 and 27, which are made preferably of round bar stock and which are used as pick-off fingers since they are adapted to pick articles from article supporting means and retain the articles in stacked relation prior to the articles becoming compartmentized by portions of tapes 14 and 21 respectively. The horizontal portions of the L-shaped fingers are disposed below the lower edge of strip material 21.

Motor 31, mounted in a suitable frame structure which comprises in part side plates 32 and 33, drives a gear 34 which via chain 35 drives another gear 36. Gear 36 is mounted on a common transverse shaft with gear 38, the latter driving by way of intermediate gearing, seen more clearly in FIGURE 2, a cam 40 and a set of timing cams 41 and 42.

When motor 31 runs through a cycle of operation, cam 40 (FIGURE 2) is rotated so as to cause reciprocatory motion of roller 18. This roller is supported within a U-shaped bracket 45 from which there extends a central push rod 46, the latter being in engagement with and driven by eccentric cam 40, this cam being mounted on a common shaft with gear 47 and the latter receiving its rotation from gear 38 via a set of intermediate gears, numerals 48, 49 and 50. Helical compression springs 51 and 52 engage guide rods 53 and 54 respectively and apply a bias to bracket 45 so as to hold the roller in its retracted position, that is away from pressure plate 24.

Articles to be compartmentized and stored are inserted in a set of pockets 60 which are mounted in nested fashion, as indicated in FIGURE 2, between a set of laterally spaced endless chains 61 along a portion of the chain loop. The chains, only one being visible in FIGURE 2, are driven in unison by motor 31 about a set of sprockets 62, 63, 64, and 65.

Each pocket, as shown more clearly in FIGURES 5 and 6, comprises three U-folded portions, numerals 60A,

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60B, and 60C. The individual pocket sections are held to one another by suitable brackets 60D, the latter brackets being formed also in a manner to fasten the pockets to the chains, see FIGURE 6. In its over-all appearance each pocket forms a U-shaped support means which is adapted to receive an article to be deposited, for instance, a money bill, which will be inserted into the pocket in an upstanding fashion.

During each cycle of operation the pockets 60 mounted on chains 61 are rotated one complete revolution whereby the pockets traverse in vertical direction (counter-clockwise as indicated by the arrow in FIGURE 2) the article insertion station 25, FIGURE 1. The pick-off fingers 26 and 27 are so disposed that they come to be positioned within the space between pocket portions 60A and 60B, and 60B and 60C respectively, yet lie in front of brackets 60D. In this manner when pockets 60 pass the pressure plate 24, individual articles inserted in pockets 60 are removed sequentially from the pockets, thereby causing a plurality of articles distributed among the several pockets to become collected, stacked, and retained at this station. As each pocket passes through the station, each removed article becomes aligned in brackets 26 and 27 and is placed in stacked relation with respect to the article removed from the preceding pocket.

The passing of pockets 60 through the article insertion station 25 is seen more clearly in FIGURE 3 wherein pocket 60 carrying an article A is shown as being disposed opposite pressure plate 24. It will be observed that at the time that pockets 60 pass through the article insertion station, roller 18 is retracted so as to permit unimpeded movement of the pockets. Slack of strip material 14, caused by rearward motion of roller 18, is taken up by resiliently biased roller 16 (FIGURE 1). When pockets 60 have moved through the article insertion station, all articles formerly contained in pockets 60 are disposed in stacked relation and are placed furthermore, between strip 21 in front and strip 14 located toward the rear. A brief moment thereafter and while motor 31 is still running, roller 18 is driven forward by virtue of its engagement with cam 40, carrying with it strip 14, thereby causing clamping pressure to be exerted at the leading edge of articles A. The articles thus become frictionally retained between strips 21 and 14. Next, cam 41 energizes its associated microswitch (FIGURE 1) to cause the so retained articles to be advanced toward the receptacle 19, thereby effecting compartmentization of the articles between both strips, and causing the articles and strips to be wound about roller 70.

Roller 70, see FIGURE 9, is driven from a motor 71 via shaft 72 fitted with a transverse pin 73 which engages vertical slots in roller 70. In this manner positive coupling is achieved between motor 71 and roller 70 contained within storage receptacle 19. When receptacle 19 is full, as sensed by switch 75 (FIGURE 1), it is lifted off plate 20 and thus uncoupled from shaft 72. It will be apparent to those skilled in the art that the receptacle is constructed with a removable top lid so as to enable authorized personnel to gain access to the stored and compartmentized material wound about roller 70. As the strips 14 and 21, retaining compartmentized articles A therebetween, enter aperture 76 of receptacle 19, they pass a knife 77 which is used to sever the strip material, particularly when removal of the storage receptacle and its contents from the apparatus is desired. The receptacle is equipped on its inside with a resiliently biased tension roller 78 about which the strip material and the compartmentized articles are wound. As soon as the strips are severed, roller 78 by means of spring 79 causes the free end of the strip material to be drawn into the inside of the receptacle thus rendering the strips and their contents inaccessible to the deposit collecting personnel. The filled receptacle then is moved off shaft 72 and delivered to the collecting establishment.

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FIGURE 4 shows in detail the arrangement of the strips and articles at plate 24. Going from front to rear on the left side there is plate 24, strip material 21, articles A and pick-off finger 26. Toward the right there is visible roller 18, knife 77, and storage receptacle 19.

The unwinding of rolls 12 and 13 is prevented by friction means more clearly illustrated in FIGURES 7 and 8. Each roll is mounted on a shaft 80 equipped with a transverse pin 81 which engages a vertical slot in bushing 83. Shaft 80 is provided also with a flange 84 having at one side thereof a friction pad 85, for instance felt, which engages plate 11. Spring 88 provides engagement pressure between friction pad 85 and the underside of plate 11. When strip material is unwound from roll 12 or 13 by operation of motor 71, the engagement between friction pad 85 and plate 11 tends to keep strips 14 and 21 taut.

Although the operation of the various elements has been indicated heretofore in connection with the identification of the various components, it will be advantageous to review the operation of the various elements and their coaction for one complete operating cycle.

When the machine is at rest, the pockets are in the position as indicated in FIGURE 2 and roller 18 is retracted as shown in FIGURE 3. A depositor desiring to operate the machine inserts articles such as money bills into pockets 60. When the machine is started by suitable control means, motor 31 is energized, causing rotation of gears 34, 36, 63, 38, 48, 49, 50 and 47. This causes the chains 61 to rotate about sprockets 62, 63, 64, and 65 thereby providing motion of the pockets 60 past the article insertion station. As the pockets move past the article insertion station, pick-off fingers 26 and 27 collect and retain in stacked relationship the individual articles A formerly disposed in pockets 60. When the pockets have left the article insertion station eccentric cam 40, driven by gear 47, advances roller 18 toward the forward position as shown in FIGURE 1, thereby clamping the articles between strips 21 and 14. A brief moment thereafter, cam 41, also driven by motor 31, causes closing of the associated circuit switch which in turn energizes motor 71 to pull the stacked articles confined between the two sets of strips into receptacle 19. As the articles pass roller 18 they become fully compartmentized.

When the articles have been moved into the storage receptacle, eccentric cam 40 permits roller 18 to again resume its retracted position as shown in FIGURE 3, pockets 60 will have resumed their location as shown in FIGURE 2, and switch 23 engaging strip 21 causes shutdown of motor 31. Switch 23 senses properly spaced perforations in strip 21 in order to effect always the same amount of material to pass the insertion station before shutdown occurs. It will be apparent that other measuring means may be used for timing purposes, such as photoelectric cells sensing perforations through which a light shines or photoelectric cells sensing spaced markings on the strips. Alternately, a measuring roller in contact with the strip material and driving a cam which in turn actuates a switch may be employed. By suitably adjusting the amount of strip material to be dispensed for each operating cycle, the apparatus may be governed in such a manner that the individual deposits do not only become compartmentized but also properly spaced from one another as indicated in FIGURE 1, wherein there is a distinct amount of spacing between succeeding deposits. In this manner a plurality of individual articles can be collected for deposit and stored as a unitary deposit which is distinct from a succeeding and similar deposit.

Cam 42 also driven by motor 31, is a timing cam to effect operation for one cycle upon starting motor 31.

Obviously, suitable burglar protection may be incorporated so as to prevent unauthorized removal of the storage receptacle containing deposits from the apparatus.

Moreover, proper locking means may be employed to

fasten the top cover to the receptacle so as to safeguard the deposits and to assure that the top cover will be opened only at the collection establishment and not in transit.

FIGURES 10, 11 and 12 show variations in the arrangement for compartmentizing articles. Whereas in the preceding illustrations a pair of strips is used, one strip in front and one strip in the rear of the articles, FIGURES 10 and 11 show an alternate arrangement wherein a single strip is cut into three lengthwise portions. Numeral 101 refers to a spool on which there is mounted a roll of paper tape 102. The tape is fed about a roller 103 and then to a pair of slitting knives 104 which are mounted between suitable brackets 105. From there the tape is fed to a roller 106 and the upper and lower tape portions 102A and 102B remain in front whereas the middle portion 102C is fed about rollers 107, 108 and 109 thus occupying the location of tape 14 of FIGURE 1. In this manner a set of three strip materials is employed using only a single roll of supply.

FIGURE 12 shows a further solution wherein a strip or length of tape material 110 is fed about a triangular die 111 to form two upstanding portions of tape 110A and 110B. These two portions forming a V may now be severed by means of a slitting knife, thus causing two separate tapes or, by means of collecting means disclosed in my aforementioned application for Letters Patent, articles are inserted into the V-shaped material so as to partially or wholly enclose the articles and then transport the entire package to the storage receptacle 19.

It is apparent that the instant arrangement readily and very simply provides a method and means for compartmentizing an article or compartmentizing a plurality of stacked articles. In this manner deposits are stored separately and distinctly from each succeeding deposit without the necessity of pre-constructed pockets or compartmentized containers. The over-all result is a considerable simplification of the apparatus and reduction in complexity of article insertion means. The storage receptacle itself is free of complex and intricate parts. Unloading of the receptacle is accomplished readily by removing the top cover, feeding the severed ends through the aperture and then unwinding the tapes which retain stacked articles, deposit by deposit. Obviously, a mechanism similar to unwinding film reels may be employed to accomplish the emptying of the receptacle.

If desired, marking means may be arranged in the apparatus to provide tapes 14 or 21 with indicia before they enter the receptacle. The indicia may constitute serial numbers, dates, codes, etc. as applicable.

It shall be understood further that without deviating from the principles disclosed the dispensing of strips, wire, or ribbon may be replaced by pre-cut or pre-folded and cut covering material. The latter material may be dispensed from a hopper to the article insertion station in order to produce the compartmentized deposit described hereinbefore.

While there have been described certain embodiments of the present invention, it will be apparent to those skilled in the art that various other modifications and changes may be incorporated without deviating from the spirit and intent of the present invention which shall be limited only by the scope of the appended claims.

What is claimed is:

1. A tape receiving receptacle for a depository apparatus comprising: an enclosure which includes a removable lid; a tape storing roller disposed in the enclosure and mounted for rotation about a fixed center; said roller adapted to have tape wound about its circumference in response to the roller being rotated about its center; an aperture in said enclosure through which tape disposed in part outside of the enclosure is adapted to enter the receptacle on its path to the roller; a movable mounted tension roller disposed in said receptacle and located for engaging said tape along its path from said aperture toward said tape storing roller; resilient means effective

upon said tension roller for causing said tape to be taut and forced in the direction toward said receptacle; a cutting means disposed in proximity to said aperture and adapted upon actuation to sever the tape, and said cutting means and tension roller being adjusted relative to one another such that the tension roller when resiliently engaging said tape has sufficient motion to pull upon actuation of the cutting means the severed tape end associated with the tape wound about the tape storing roller through the aperture into the receptacle.

2. A tape receiving receptacle for a depository apparatus comprising: an enclosure which includes a removable lid; a tape storing roller disposed in the enclosure and mounted for rotation about a fixed center; said roller adapted to have a pair of superposed tapes wound in concentric layers about its circumference in response to the roller being rotated about its center; an aperture in said enclosure through which the pair of superposed tapes disposed in part outside of the enclosure is adapted to enter the receptacle on its path to the roller; a tension roller fastened to a pivotally mounted lever disposed in said receptacle and located for engaging the side of one of said tapes along the path of said tapes from said aperture toward said storage roller; resilient means effective upon said lever for causing said tapes to be taut and causing said tension roller to exert a pulling force upon the tapes in the direction away from said aperture toward said receptacle; a cutting means disposed outside said enclosure in proximity to said aperture and adapted upon actuation to sever said tapes, and said cutting means and pivoting lever being adjusted such that the tension roller when engaging said one tape has sufficient motion to pull upon actuation of the cutting means the severed tape ends under tension by said tension roller through the aperture into the receptacle for concealing said respective ends.

3. A tape receiving receptacle for a depository apparatus comprising: an enclosure which includes a removable lid; a tape storing roller disposed in the enclosure and mounted for rotation about a fixed center; said roller adapted to have a pair of superposed tapes wound in concentric layers about its circumference in response to the roller being rotated about its center; an aperture in said enclosure through which the pair of superposed tapes disposed in part outside of the enclosure is adapted to enter the receptacle on its path to the roller; a tension roller fastened to a pivotally mounted lever disposed in said receptacle and located for engaging the side of one of said tapes along the path of said tapes from said aperture toward said storage roller; resilient means effective upon said lever for causing said tapes to be taut and causing said tension roller to exert a pulling force upon the tapes in the direction away from said aperture toward said receptacle; a cutting means disposed outside said enclosure in proximity to said aperture and adapted upon actuation to sever said tapes; said cutting means and pivoting lever being spaced such that the tension roller when engaging said one tape has sufficient motion to pull upon actuation of the cutting means the severed tape ends under tension by said tension roller through the aperture into the receptacle for concealing said ends, and switching means disposed for actuation when the concentric layers on said roller assume a predetermined size, denoting the filled condition of the receptacle.

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