



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.06.2001 Bulletin 2001/24

(51) Int Cl.7: **G07D 1/00**, G07D 9/00,
G07F 11/42

(21) Application number: **99309795.5**

(22) Date of filing: **06.12.1999**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Jenkins, Stuart McEwen**
Bognor Regis, West Sussex PO21 2NY (GB)

(74) Representative: **Townsend, Victoria Jayne et al**
Fry Heath & Spence,
The Old College,
53 High Street
Horley, Surrey RH6 7BN (GB)

(71) Applicant: **DSD Systems, Inc.**
Marco Island, FL 34146 (US)

(54) **Wrapped coin dispenser**

(57) A wrapped coin roll dispensing apparatus comprising a plurality of magazines (25), means of supporting the magazines in a substantially vertical alignment (26), and a lifting conveyor (2), the lifting conveyor having a plurality of hods (3) about its periphery, the hods being interfaceable with the outlets of the magazines and adapted to receive coin rolls (1) for transportation to a dispenser tray, wherein each magazine is provided with a gate (80) for closing the outlet, the gate being pivotally mounted to the apparatus so as to allow the gate

to pivot freely between an outlet closed position and an outlet open position, the arrangement being such that the gate of one magazine is held closed by coin rolls carried in an adjacent magazine but is free to pivot to an open position when the adjacent magazine is empty or removed and an empty hod aligns with the outlet. The apparatus provides reduced friction in operation compared to prior art arrangements and thus provides a more energy efficient apparatus and reduced opportunity for a coin roll wrapping to be worn and the coin rolls to collapse.

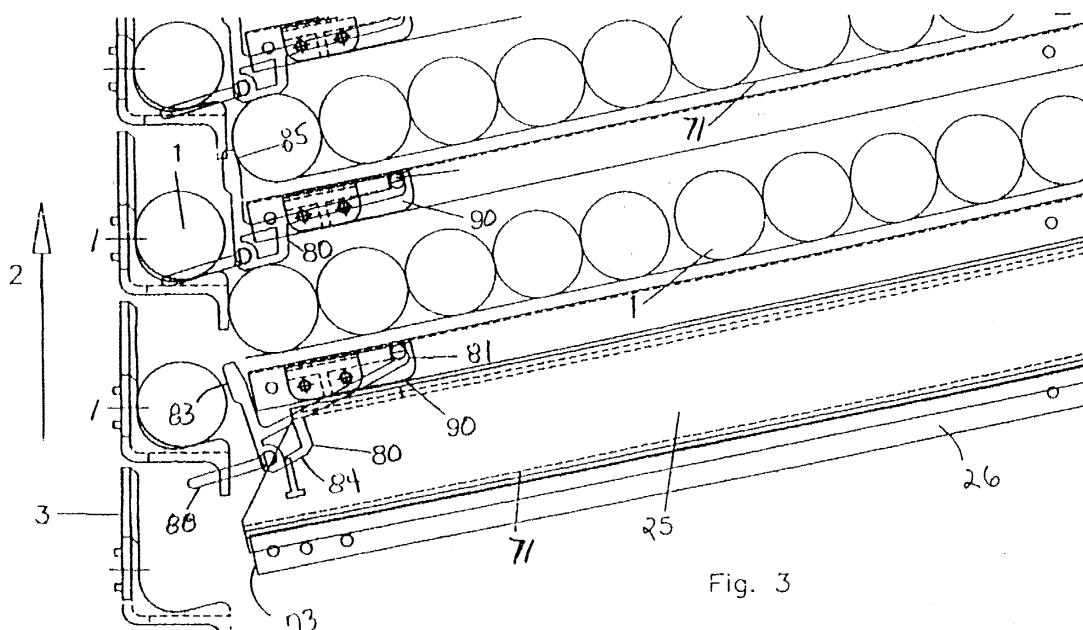


Fig. 3

Description

[0001] This invention relates to a coin dispensing apparatus and more particularly to an improvement in the apparatus for the storage and dispensing of wrapped rolls of coins.

[0002] Current coin dispensing machines are normally of the hopper storage type which require the coin to be stored in bulk and thus create problems for the operator loading the hopper because of the considerable weight of the coin involved and the physical effort required to load the hopper.

[0003] Existing hopper delivery systems require the coin or coin rolls to be loaded at the top of the hopper and the coin rolls are delivered at the bottom of the hopper. This has a disadvantage to the user of the apparatus in that the coin rolls are not delivered at a convenient height for the user. It is generally impractical to mount the coin dispensing apparatus at a higher level due to the considerable weight of the coins involved and the need for the person loading the coins to lift the coins to the higher level to fill the hopper.

[0004] Another significant problem with existing hopper delivery systems occurs when the coin rolls are wrapped in plastic film. Experience has shown that plastic wrapped coin rolls are very prone to wear, often resulting in the collapse of the roll and the release of loose coins into the mechanism. This wear is in part caused by high friction between rolls which rub against each other, often under a heavy weight, when the apparatus is in operation to deliver coins to the delivery outlet. One solution to the above problem is proposed by the applicants in co-pending GB Patent Application No. 9619971.6 and International Patent Application No. W098/13792. These prior applications describe a coin dispensing apparatus which incorporates a lifting conveyor having a plurality of hods, the hods being incrementally driven by the lifting conveyor. The hods of the conveyor interact with the outlet of a plurality of magazines carrying coin rolls. The lifting conveyor turns continuously in one direction collecting coin rolls from the magazines and carrying them to a dispensing outlet. The magazines are emptied in sequence and preferably from bottom to top. This arrangement permits the delivery of the coins at a convenient height to the user, whilst providing for the coins to be loaded in magazines of a manageable size and weight. The magazines provide some separation of the rolls being held for delivery and thus reduces the opportunities for potential damage to plastic wrapped rolls and consequential release of loose coins into the main body of the apparatus.

[0005] Preferred features of the apparatus previously described in the prior filed applications include providing an automatically operated chock at the outlet of the magazines to release the flow of rolls of coins from the magazine when the magazine is correctly fitted into the coin dispensing apparatus. The chock is automatically closed before the or each magazine is removed from

the apparatus. The chock can conveniently be operated from a releasable locking mechanism at the rear of the magazine. In addition, the magazine may include a constant force spring connected with a slidable packing plate at the rear of the magazine to apply pressure to the coin rolls so as to urge them towards the magazine outlet.

[0006] A preferred construction of the coin roll dispenser described above has a housing which is divided into two parts, a lower armour plated secure safe for the coin dispensing apparatus itself, and an upper part for housing a computer controlled means for accepting bank cards and bank notes and for delivering bank notes and coin rolls.

[0007] The present invention is directed to improving on the apparatus described and claimed in the prior filed applications made by the applicant.

[0008] The present invention provides a wrapped coin roll dispensing apparatus comprising a plurality of magazines, means for supporting the magazines in substantially vertical alignment, and a lifting conveyor, the lifting conveyor having a plurality of hods about its periphery, the hods being interfaceable with the outlets of the magazines and adapted to receive coin rolls for transportation to a dispenser tray, wherein each magazine is provided with a gate for closing the outlet, the gate being pivotally mounted to the apparatus so as to allow the gate to pivot freely between an outlet closed position and an outlet open position, the arrangement being such that the gate of one magazine is held closed by coin rolls carried in an adjacent magazine but is free to pivot to an open position when the adjacent magazine is empty or removed and an empty hod aligns with the outlet.

[0009] Preferably, the gate further comprises a lever arm for manually closing the gate and holding it in a closed position during loading of the coin roll dispensing apparatus.

[0010] Thus it can be seen that the gate provided on the magazine controls the flow of coin rolls into hods incrementally driven by the lifting conveyor. The gate mechanism is geometrically arranged to automatically inter-relate with 1) the coin roll about to be fed from a magazine into an empty hod position, 2) the coin roll waiting to be fed from the magazine immediately adjacent to this position, and 3) the coin rolls being transported in the hod between adjacent magazines. Each gate is held in the above described controlling position by successive coin rolls in each magazine until that magazine becomes empty of coin rolls. When this state occurs, the gate is free to pivot into the open position to allow the magazine immediately adjacent to begin to feed coin rolls when the next empty hod position becomes available.

[0011] Preferably the magazine is also provided with a detachable retainer to hold the coins in the magazine while the magazine is being transported to the dispenser. Conveniently the retainer is provided in the form of a strip or bar which can be slotted through slots provided

in the sides of the magazine. These clips can conveniently be withdrawn from the side of the magazine once the magazine is in position in the dispensing apparatus, thus allowing release of the first coin roll into an empty hod.

[0012] In order to provide a better understanding of the invention, its operating advantages and the specific objects attained by its uses, one embodiment of the invention will now be described with reference to the following figures, in which

[0013] Figure 1 shows a fragmentary side elevation of a coin dispensing apparatus according to the invention in which a hod is receiving a coin roll from a magazine.

[0014] Figure 2 shows a fragmentary side elevation of a coin dispensing apparatus according to the invention in which a hod containing a coin roll is maintaining closure of the gate to allow a coin roll in an adjacent magazine to feed into an empty hod.

[0015] Figure 3 shows a fragmentary side elevation of a coin dispensing apparatus according to the invention in which a magazine is feeding coin rolls into a vacant hod and the gate of the adjacent magazine is maintained closed.

[0016] Figure 4 shows a fragmentary cross section taken along the line 4-4 shown in Figure 2 showing a magazine waiting to dispense coin rolls at position (D), a second magazine dispensing coin rolls at (E), and an empty magazine at (F).

[0017] Figure 5 shows a fragmentary cross section taken along the line 5-5 of Figure 1 prior to the removal of the clip retainer.

[0018] Referring now to the figures in more detail wherein like elements are indicated by like numerals one embodiment of the invention is described. As can be seen, the coin roll dispensing apparatus comprises a lifting conveyor indicated generally by 2, with a plurality of hods 3 driven by an endless chain (not shown) and a plurality of shelves 26 supporting a plurality of magazines 25. The magazines 25, only one of which is shown for clarity in figures 1 and 3, are inserted from the side of the dispenser. The coin rolls 1 are contained in a magazine 25 by means of clip retainer 70 (illustrated in Figure 5). The clip retainer 70 is subsequently removed after the magazines 25 have been loaded into the dispenser. The level of the coin rolls 1 in a magazine 25 is indicated by the line 71.

[0019] Each shelf 26 has a gate mechanism 80 attached thereto. Each gate mechanism has a proximal end 81 and a distal end 82. The proximal end 81 is pivotally attached to a bracket 90 which in turn is fixedly attached to the underside 72 of a shelf 26 near to the shelf end 73 nearest to the lifting conveyor 2. On the underside of each shelf 72 is a bracket 90. As can be seen in Figure 2 the distal end of the gate 82 is unattached and terminates in a T-shaped element 86 with a lower connecting element 87. The geometrical configuration of the gate 80 results in three operational/func-

tional surfaces. The T-element 86 has an inner surface facing toward the proximal end of the gate 81 and an opposite outer surface 83 facing away from the proximal end 81. The lower connecting element 87 has a bottom surface 84 generally perpendicular to the T-element inner and outer surfaces 85, 83. The T-element outer surface 83 communicates with and is held in a closed position by the coin rolls 1 carried upwards in the hods 3. The lower connecting element bottom surface 84 communicates with the coin rolls 1 in the magazines 25. The T-element inner surface 85 communicates with and retains in position the coin rolls 1 in the magazine 25 immediately above the gate mechanism 80. The lower connecting element 87 has an extension element connected thereto.

[0020] In operation extension element 88 can be used to close the gate 80 by hand. This allows entry of the magazine 25 onto a shelf 26 in the dispenser. When the extension element 88 is released, the second surface 84 rests on the coin rolls 1 in the magazine immediately below. The dispenser is loaded with magazines 25 from the bottom up. When this loading is complete, the clip retainer 70 is removed from each magazine 25 in a bottom up sequence to release the coin rolls 1. The coin rolls 1 roll forward to rest against the T-element inner surface 85 with the exception of the lowest magazine in which the coin rolls 1 roll forward into an open hod 3 as can be seen in Figure 1.

[0021] The weight of the coin rolls 1 pushing against the T-element inner surface 85 creates a downward pressure on the lower connecting element bottom surface 84 and onto the coin roll immediately beneath it. This pressure can impede the passage of coin rolls 1. However, this pressure is momentarily relieved by the engagement between a coin roll 1 in an adjacent hod 3 and the T-element outer surface 83 when the lifting conveyor is driven incrementally between magazine levels. Thus the passing of a full hod past a full magazine relieves pressure on coin rolls carried in the magazine immediately below.

[0022] When the last coin roll 1 from a magazine 25 is delivered to a hod 3 and clears the next higher magazine position, thus presenting an empty hod 3 to the T-element outer surface 83, the pressure on the T-element inner surface 85 is unopposed and the gate 80 pivots downward and inward away from the lifting conveyor 2.

[0023] Due to the interaction between the T-element outer surface 83 and inner surface 85, the arrangement greatly reduces the friction load in the dispenser.

[0024] In previous arrangements coin rolls carried in the hods brushed past coin rolls situated adjacent the outlet of each magazine causing jostling of the coin rolls under friction and consequent wear of the coin roll wrappings. This resulted in relatively high power use in the equipment as well as a propensity for worn coin rolls to collapse and occasionally interfere with the operation of the dispensing apparatus.

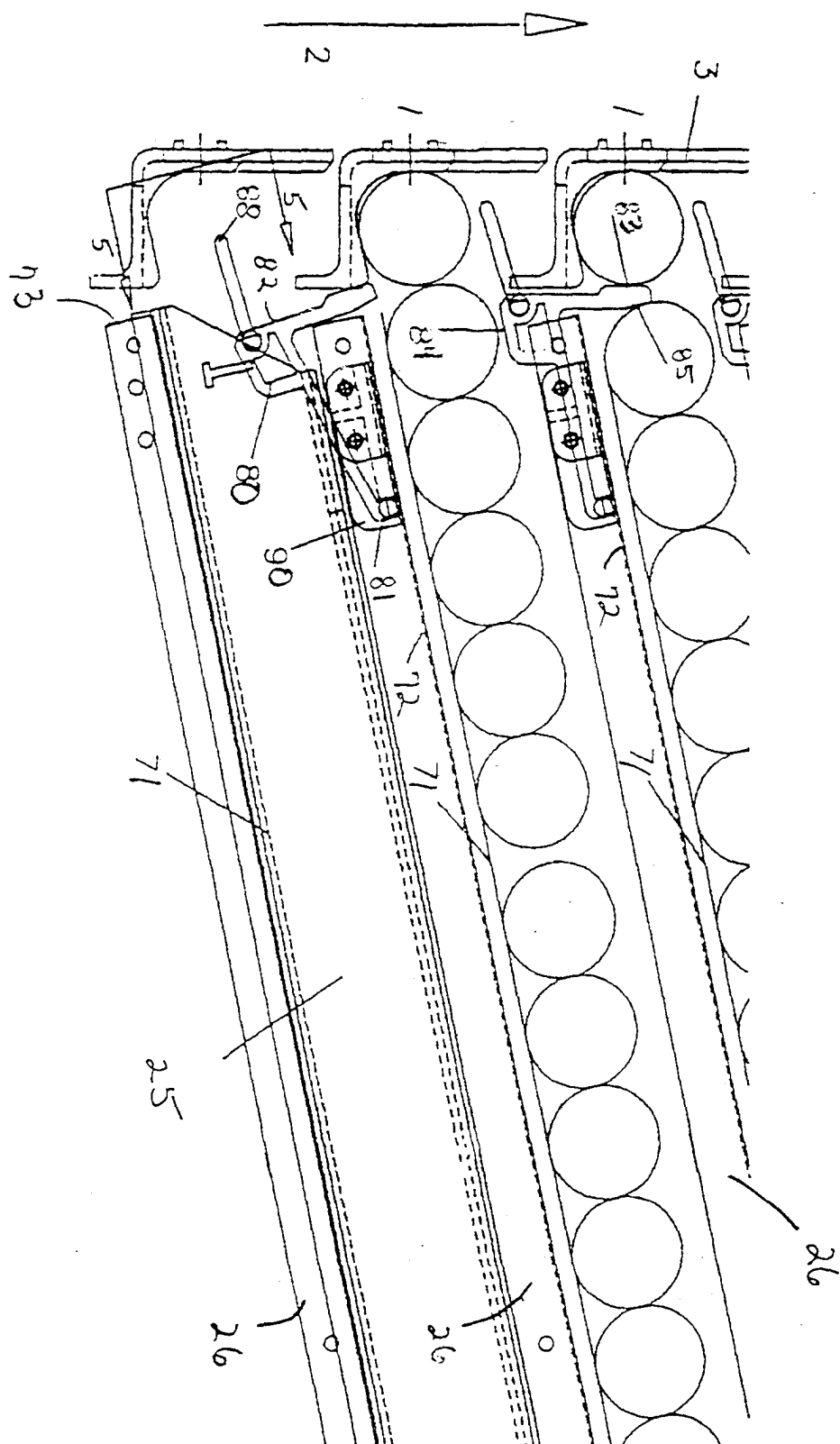
[0025] Thus the apparatus according to the present

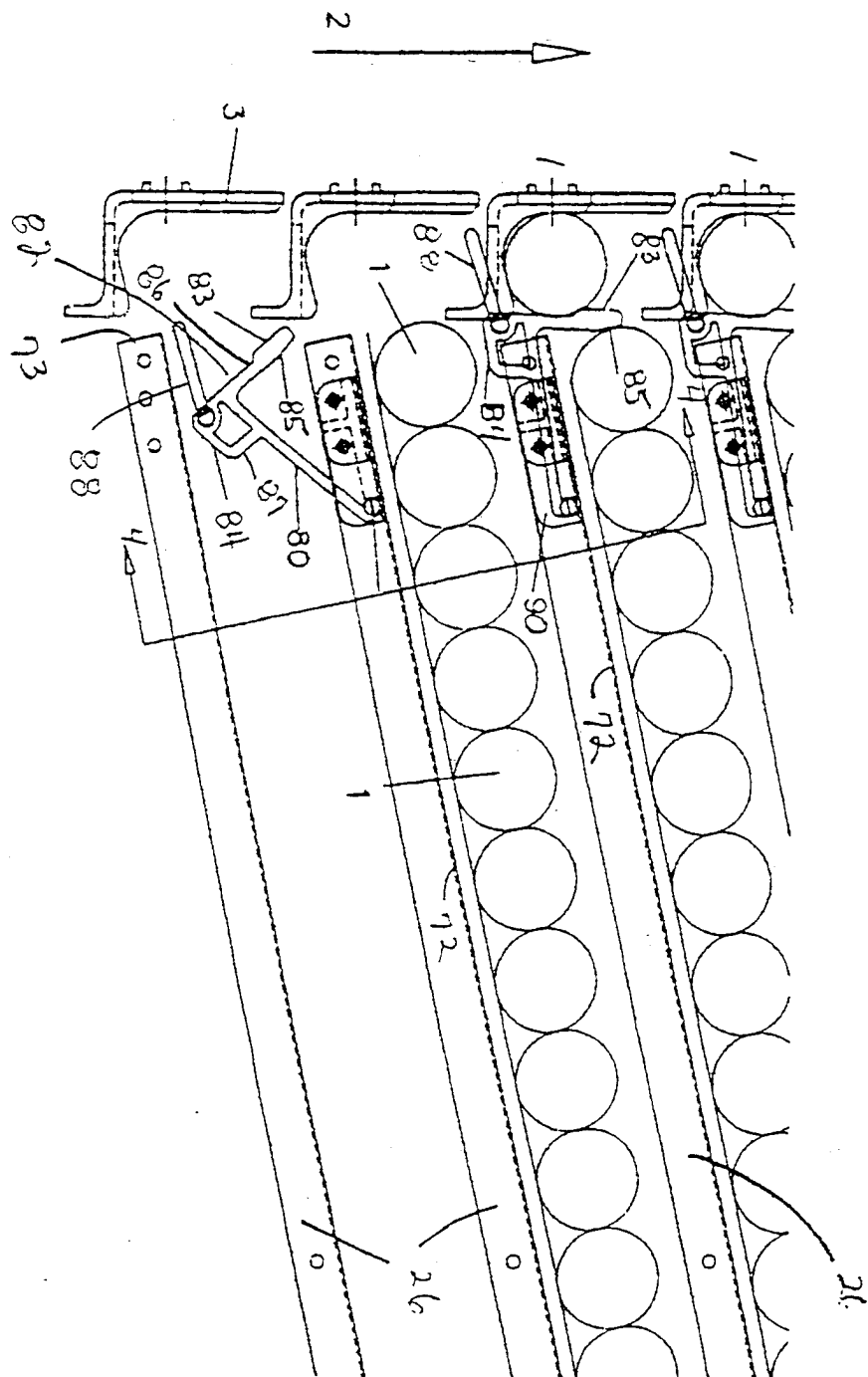
invention provides a more energy efficient apparatus which is less prone to damage or down time due to the undesirable collapse of wrapped coin rolls carried thereby. Whilst the apparatus is equally suited to all kinds of coin roll wrapping, it is particularly suited to plastic wrapped coin rolls.

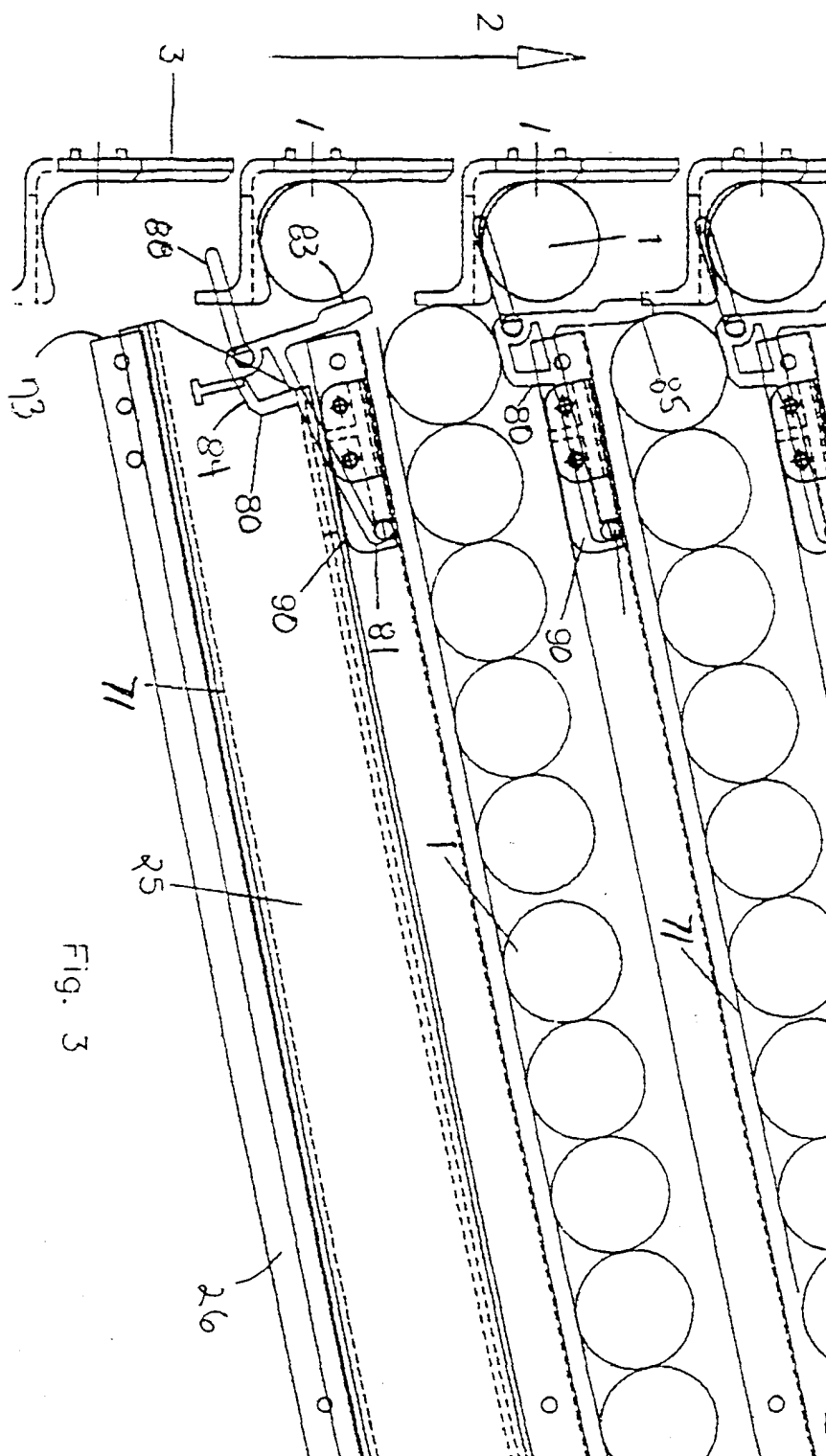
[0026] It is to be understood that the embodiments described are merely illustrative of the present invention and are not intended to detract or limit the scope of the invention as claimed in the appended claims.

Claims

1. A wrapped coin roll dispensing apparatus comprising a plurality of magazines (25), means for supporting the magazines in substantially vertical alignment (26), and a lifting conveyor (2), the lifting conveyor having a plurality of hods (3) about its periphery, the hods being interfaceable with the outlets of the magazines and adapted to receive coin rolls (1) for transportation to a dispenser tray, wherein each magazine is provided with a gate (80) for closing the outlet, the gate being pivotally mounted to the apparatus so as to allow the gate to pivot freely between an outlet closed position and an outlet open position, the arrangement being such that the gate of one magazine is held closed by coin rolls carried in an adjacent magazine but is free to pivot to an open position when the adjacent magazine is empty or removed and an empty hod aligns with the outlet.
2. A wrapped coin roll dispensing apparatus magazine as claimed in claim 1 wherein each gate further comprises a lever arm (88) for manually closing the gate and holding it in a closed position during loading of the coin roll dispensing apparatus.
3. A wrapped coin roll dispensing apparatus as claimed in claim 1 or claim 2 wherein the magazines are provided with a detachable retainer (70) for retaining the coin rolls in the magazine during transit.
4. A wrapped coin roll dispensing apparatus as claimed in claim 3 wherein the retainer is in the form of a strip which is slottable and slideable through slots provided in the walls of the magazine.
5. A wrapped coin roll dispensing apparatus as claimed in any preceding claim wherein the means for supporting the magazines in substantially vertical alignment is a series of shelves and each gate is pivotally mounted to a bracket on the underside of a shelf.
6. A wrapped coin roll dispensing apparatus as claimed in any one of claims 1 to 4 wherein the gate is pivotally mounted to the magazine.
7. A wrapped coin roll dispensing apparatus as claimed in any preceding claim wherein a second conveyor is provided for transporting the coin rolls from the lifting conveyor to the dispensing tray.
8. A wrapped coin roll dispensing apparatus as claimed in any preceding claim wherein the apparatus is provided with sensors for detecting and alerting the user that the quantity of coin rolls has fallen to a set level.
9. A wrapped coin roll dispensing apparatus as claimed in any preceding claim wherein the hods of the lifting conveyor are substantially "U"- shaped.
10. A wrapped coin roll dispensing apparatus as claimed in any preceding claim wherein the magazines are provided with urging means for urging the coin rolls towards the outlet of the magazine.
11. A wrapped coin dispenser as claimed in claim 10 wherein the urging means is in the form of a constant force spring connected with a slideable packing plate at the rear of the magazine, the plate communicating with the coin rolls.
12. A wrapped coin roll dispensing apparatus as claimed in any preceding claim wherein the hods run between side guide rails.
13. A wrapped coin roll dispensing apparatus magazine as claimed in any preceding claim wherein the magazines are emptied sequentially starting from the one positioned lowest in the apparatus and the gates fall open under gravity.
14. A wrapped coin roll dispensing apparatus wherein the apparatus is located in a housing which is divided into two parts, a lower armour plated secure safe for the coin dispensing apparatus and an upper part for housing a computer controlled means for accepting and delivering bank notes and delivering the coin rolls.







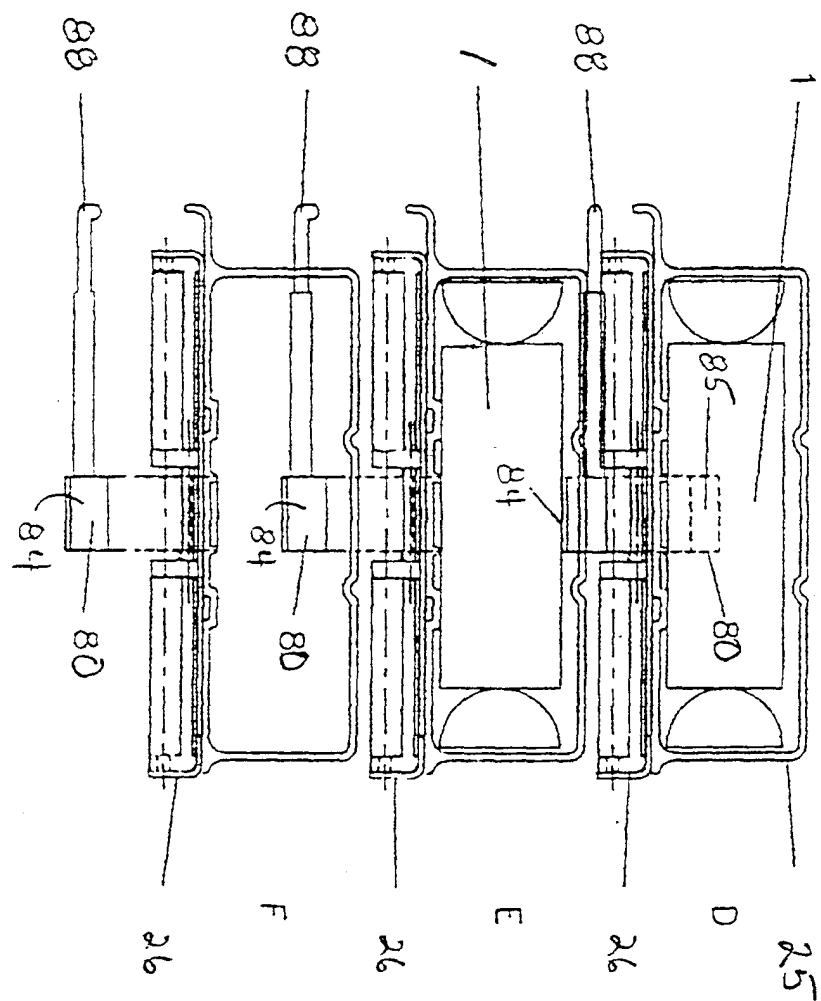


FIG. 4

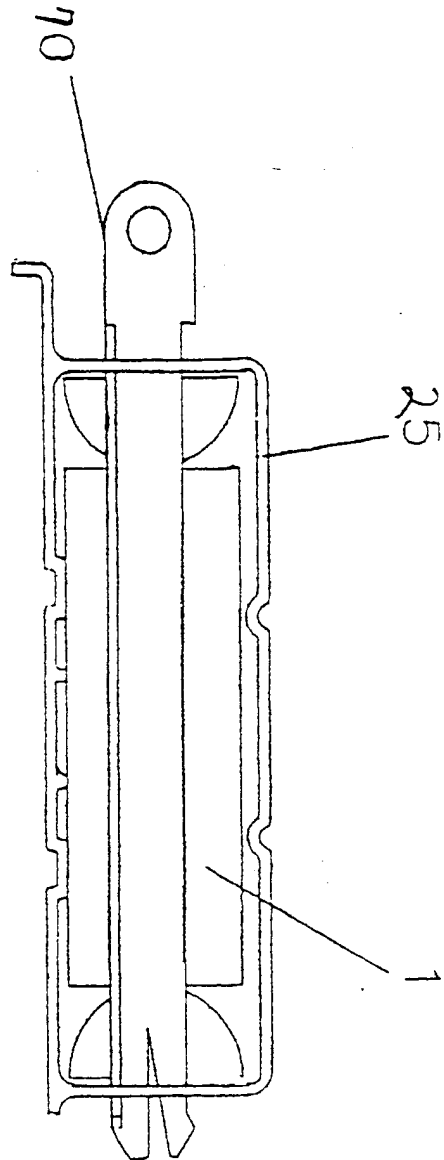


Fig. 5



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 30 9795

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y, D	WO 98 13792 A (HUCKLE RALPH EDWARD ; JENKINS STUART MCEWEN (GB); CEJAY ENG INC (US) 2 April 1998 (1998-04-02) * the whole document *	1, 5, 6, 8-12, 14	G07D1/00 G07D9/00 G07F11/42
A	---	13	
Y	US 4 717 044 A (SUZUKI MORIO ET AL) 5 January 1988 (1988-01-05) * column 1, line 43 - line 68 * * column 2, line 37 - column 4, line 2 * * figures 1, 2, 4 *	1, 5, 6, 9-12, 14	
Y	US 5 938 072 A (GOUIN FREDERIC ET AL) 17 August 1999 (1999-08-17) * column 3, line 13 - line 30 * * column 4, line 6 - line 20 * * figures 2, 5, 6 *	8	
A	---	1, 12, 14	
A	DE 40 20 546 A (KUBON KLAUS) 2 January 1992 (1992-01-02) * column 2, line 59 - column 3, line 47; figures 1-3 *	1	
A	---		
A	US 4 840 290 A (NAKAMURA SHUNICHI ET AL) 20 June 1989 (1989-06-20)		TECHNICAL FIELDS SEARCHED (Int.Cl.7) G07D G07F
E	US 6 095 369 A (HUCKLE RALPH E ET AL) 1 August 2000 (2000-08-01) * claims 1-6; figures 1A, 2A, 11-13 *	1, 2, 5, 6, 9, 12, 14	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 October 2000	Examiner Paraf, E
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 30 9795

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-10-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9813792 A	02-04-1998	GB 2314062 A EP 0875043 A	17-12-1997 04-11-1998
US 4717044 A	05-01-1988	DE 3630191 A	19-03-1987
US 5938072 A	17-08-1999	AU 9387198 A EP 1037838 A WO 9914144 A	05-04-1999 27-09-2000 25-03-1999
DE 4020546 A	02-01-1992	NONE	
US 4840290 A	20-06-1989	JP 1922759 C JP 6052548 B JP 62202295 A JP 2084579 C JP 7027584 B JP 62202296 A	07-04-1995 06-07-1994 05-09-1987 23-08-1996 29-03-1995 05-09-1987
US 6095369 A	01-08-2000	NONE	