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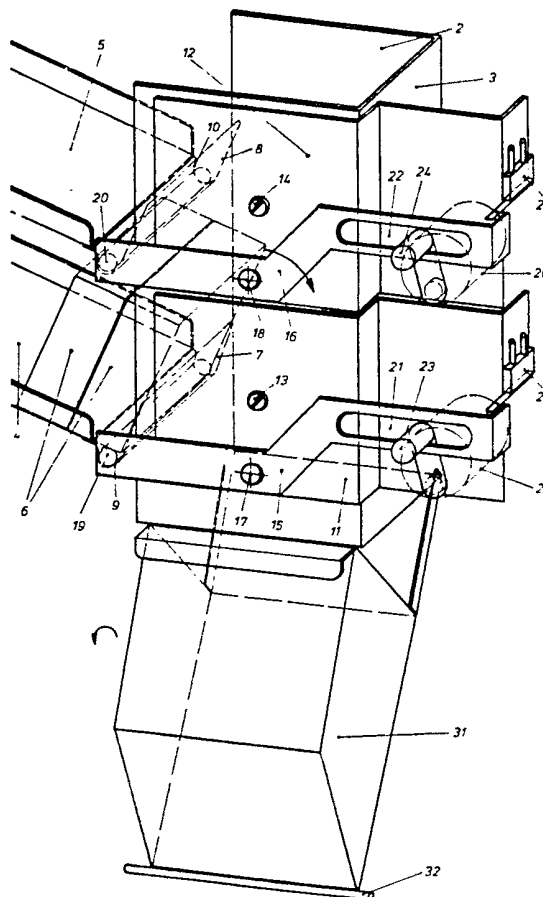
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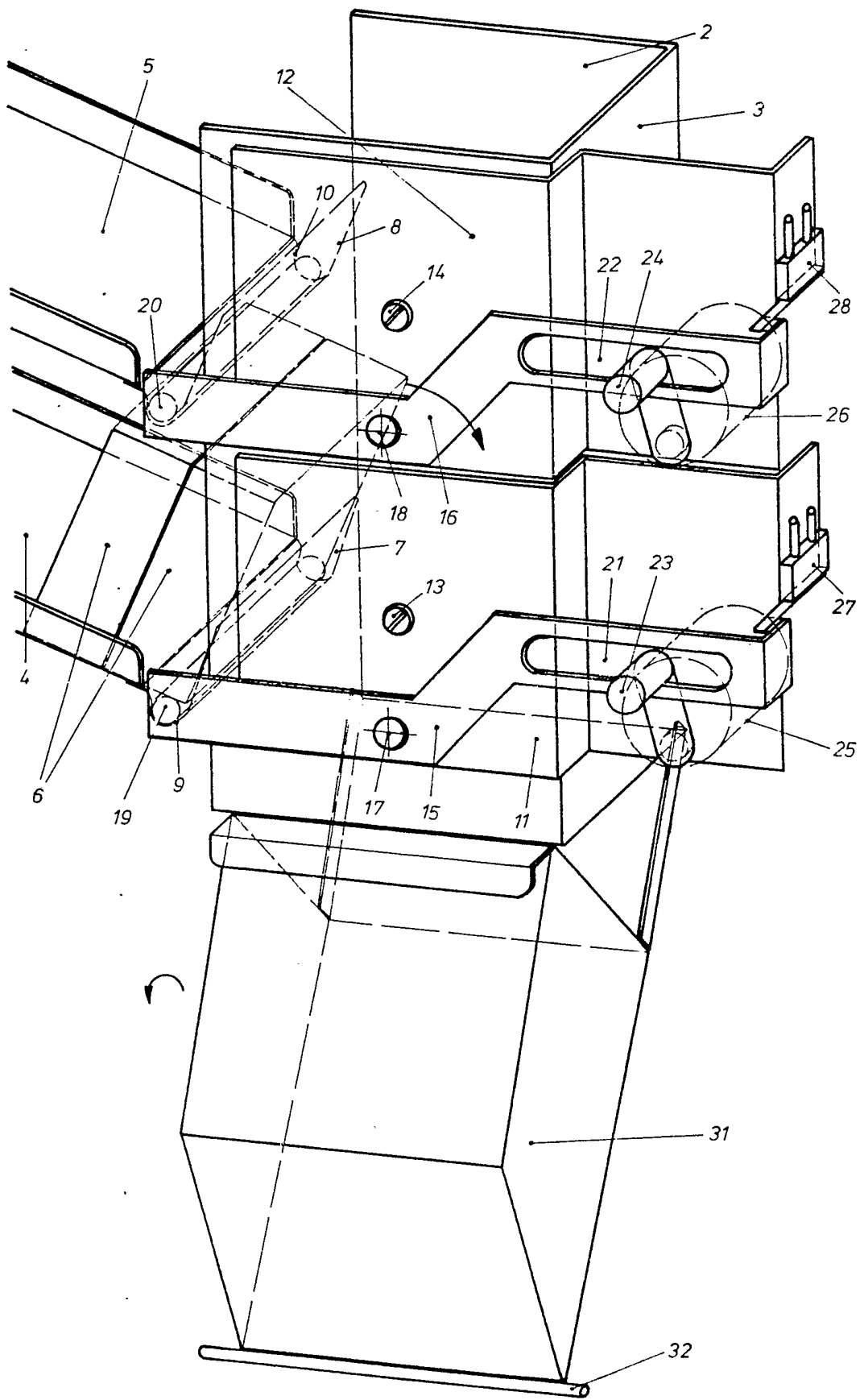
(54) **Vending machine**

(57) A vending machine for the ejection of a packet 6 of goods from the end of a stack of packets of goods has an inclined elongate chute 4 which holds the stack, a free drop and dispensing channel 2 at the lower of the chute, and a dispenser. The dispenser comprises an abutment wall 7 against which the packet to be dispensed rests, and a rod 19 situated in a channel 9, beneath the packet to be dispensed the rod being movable upwardly out of the channel by a lever 15 which is movable by an electric motor 25.

On actuation of the electric motor 25, the lever is pivoted and moves the rod 19 out of the channel 9, thus lifting the packet over the abutment wall and into the free drop and dispensing channel 2 which is connected to a dispensing receptacle 31, from which the packet may be taken.



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## SPECIFICATION

**Vending machine**

5 The invention relates to a vending machine, and particularly, but not exclusively, to a vending machine for the ejection of a packet of goods from an end of a stack of packets of goods disposed adjacent to one another, comprising an elongate chute for depositing the stack, a free drop and dispensing channel, located at a delivery end of the chute, for the packet of goods, and at the delivery end of the chute a lifter, having an actuating mechanism, for the packet of goods.

10 A vending machine of this kind is already commercially available. The dispenser of this vending machine is a friction wheel having an actuating mechanism provided with a miniature geared electric motor. The friction wheel displaces the packet of goods at the end of the stack transversely of the chute into the free drop and dispensing channel located on the side of the chute. The commercially available vending machine has a particularly deep housing as a result of this dispensing channel which is mounted on the side of the chute. Furthermore, in the event of packets of goods sticking to one another in the stack, the frictional force of the friction wheel is no longer sufficient to eject the packet of goods located at the end of the stack, thereby impairing the ability of the vending machine to function.

15 In accordance with the invention, a vending machine for the ejection of a packet of goods from an end of a stack of packets of goods disposed adjacent to one another comprises an elongate chute for depositing the stack, a free drop and dispensing channel, located at a delivery end of the chute, for the packet of goods, an abutment wall for the end of the stack at the delivery end of the chute, and a dispenser in the form of a lever, provided with a pivot axis substantially transversely of the chute and a lifter for engaging below the packet of goods to be ejected and an actuating mechanism, for the packet of goods at the delivery end of the chute, wherein the pivot axis of the lever extends through the free drop and dispensing channel, and the lifter extends substantially transversely of the longitudinal direction of the chute, is of pin-like construction and engages behind the abutment wall for the purpose of lifting the packet of goods to be ejected over the abutment wall.

20 The invention provides an operationally reliable vending machine having a housing of minimum depth.

25 Hence, the delivery end of the chute opens into the free drop and dispensing channel which is disposed in the longitudinal direction of the chute adjacent thereto and not laterally thereof, and hence no longer effects the depth of the housing of the vending machine. The

30 lifting of the packet of goods at the delivery end of the chute by means of the lifter forcibly, and hence reliably, releases the packet of goods stuck to the adjacent packet of goods at the delivery end of the chute, so that malfunctions of the vending machine are avoided. Furthermore, only a very small amount of travel of the lever is required to lift the packet of goods to be ejected over the abutment wall at the delivery of the chute, so that the dispenser may also have a mechanical actuating mechanism which has only a small amount of actuating travel and therefore has a particularly easy action.

35 By way of example only, a specific embodiment of the invention will be further described with reference to the accompanying drawing, which is a perspective view, partly cut away, of an embodiment of vertically disposed free drop and dispensing channel of a vending machine according to the invention.

40 A free drop and dispensing channel 2 is formed by a sheet metal wall 3 of U-shaped cross section, so that the free drop and dispensing channel 2 is open at one side. Two elongate chutes 4, 5, on which packets of goods can be disposed adjacent to one another in the form of a stack, open into the open side of the free drop and dispensing channel 2. Two such packets of goods 6 may be seen at the delivery end of the chute 4.

45 Each of the chutes 4 and 5 has at its delivery end an abutment wall 7 or 8 respectively which extends transversely of the longitudinal direction of the respective chute. Furthermore, the chutes 4 and 5 slope towards the free drop and dispensing channel 2, so that the stacks of packets of goods disposed on the chutes 4 and 5 abut against the abutment walls 7 and 8 on an inclined plane under the action of gravity. In order to increase the effect of gravity, a loader or weighter (not illustrated) associated with the stacks formed by the packets of goods can be disposed on each of the chutes 4 and 5.

50 Advantageously, a transverse concave corrugation or channel 9 or 10 is provided upstream of the abutment wall 7 or 8 respectively in each of the bearing surfaces of the chutes 4 and 5 for the respective stack of packets of goods. Advantageously, the width of the transverse corrugations or channels 9 and 10 is smaller than the depth of the packets of goods 6.

55 Two support plates 11 and 12 are secured to the outside of the sheet metal wall 3 of the free drop and dispensing channel 2 by means of a respective screw 13 or 14. A respective two-arm lever 15 or 16 serving as a dispenser is mounted on each of the support plates 11 and 12. Each lever 15 and 16 is pivotal about a respective journal bearing 17 or 18 which is located on the relevant support plate 11 or 12 respectively in such a way that the pivot axis of each lever 15 and 16 extends transversely

of the longitudinal direction of the chutes 4 and 5 and transversely through the free drop and dispensing channel 2.

A respective pin-like lifter 19 or 20 is secured to one end of each lever 15 and 16 and extends transversely of the longitudinal direction of the chutes 4 and 5. The lifter 19 on the lever 15 enters the transverse corrugation 9 upstream of the abutment wall 7 at the delivery end of the chute 4, and the lifter 20 on the lever 16 enters the transverse corrugation 10 upstream of the abutment wall 8 at the delivery end of the chute 5.

The other end of each lever 15 and 16 has a slotted hole 21 or 22 respectively. A driver lug 23 or 24 of a respective crank engages each of the two slotted holes 21 or 22, each crank being mounted on the drive shaft of a respective one of miniature geared electric motors 25 and 26 constituting actuating mechanisms. The miniature geared motor 25 has the driver lug 23 secured to a lug of the support plate 11, and the miniature geared electric motor 26 has the driver lug 24 connected to a lug of the support plate 12. An electric limit switch 27 or 28 for the miniature geared electric motor 25 or 26 respectively is secured to the same lug as the miniature geared electric motors 25 and 26 respectively. Each limit switch 27 or 28 is actuated respectively by the end of the respective lever 15 or 16 having the respective slotted hole 21 or 22.

After coins have been inserted into the vending machine and a trigger or tripping device associated with, for example, the chute 4, has been actuated, the drive shaft of the miniature geared electric motor 25 rotates through 360°, during the course of which the lever 15 moves the lifter 19 upwardly out of the transverse corrugation 9 and the lifter lifts the packet of goods 6 at the delivery end of the chute 4 over the abutment wall 7, so that the packet of goods is ejected into the free drop and dispensing channel 2. Upon lifting out the packet of goods 6 at the delivery end of the chute 4, the packet of goods 6 adjacent to the aforesaid packet of goods 6 is held down by the chute 5. A special holding-down shield (not illustrated) may be associated with the chute 5 for the purpose of holding down the packet of goods located on the chute 5 adjacent to the packet of goods at the delivery end.

The packet of goods 6 in the free drop and dispensing channel 2 drops into a dispensing receptacle 31 at the bottom of the free drop and dispensing channel 2. The dispensing receptacle 31 may be pivoted forwardly about a pivot 32, so that the packet of goods 6 can be finally removed from the dispensing receptacle 31.

It is advantageous if the bearing surfaces of the chutes 4 and 5 have two projecting or convex longitudinal corrugations or ribs (not

illustrated), thereby reducing the frictional losses for the packets of goods on the two chutes 4 and 5.

Alternatively, mechanical actuating mechanisms may be provided instead of the miniature geared electric motors 25 and 26.

#### CLAIMS

1. A vending machine for the ejection of a packet of goods from an end of a stack of packets of goods disposed adjacent to one another, comprising an elongate chute for depositing the stack, a free drop and dispensing channel, located at a delivery end of the chute, for the packet of goods, an abutment wall for the end of the stack at the delivery end of the chute, and a dispenser in the form of a lever, provided with a pivot axis substantially transversely of the chute and a lifter for engaging below the packet of goods to be ejected and an actuating mechanism, for the packet of goods at the delivery end of the chute, wherein the pivot axis of the lever extends through the free drop and dispensing channel, and lifter extends substantially transversely of the longitudinal direction of the chute, is of pin-like construction and engages behind the abutment wall for the purpose of lifting the packet of goods to be ejected over the abutment wall.

2. A vending machine as claimed in claim 1, wherein the bearing surface of the chute for the stack has upstream of the abutment wall a transverse concave corrugation for receiving the lifter.

3. A vending machine as claimed in claim 1 or claim 2, wherein the bearing surface of the chute has two longitudinal convex corrugations.

4. A vending machine as claimed in any of claims 1 to 3, wherein the pivot axis of the lever extends substantially transversely through the free drop and dispensing channel and that the lifter is located substantially transversely of the longitudinal direction of the chute, is of pin-like construction and engages behind the abutment wall in order to lift the packet of goods to be ejected above the abutment wall.

5. A vending machine for the ejection of a packet of goods from an end of a stack of packets of goods disposed adjacent to one another, substantially as herein described, with reference to, and as illustrated in, the accompanying drawing.