Figure 16 shows the same view of the apparatus of figures 1 to 10 and 12 to 15 with the sachet referred to in the description of figures 12, 13 and 14 falling into the dispensing container referred to in the description of figure 10.

DETAILED DESCRIPTION OF THE DRAWINGS

With reference to the drawings a labelling apparatus is generally indicated by reference numeral 1.

The labelling apparatus 1 includes a conveyor means for having a receiving end that terminates underneath an outlet of a chute 2 and on opposite discharge end that terminates over a dispensing container 9. The conveyor means is a continuous conveyor belt 4 for located over rollers 5. The rollers 5 are supported between roller support braces 6. The support braces 6 are, in turn, attached to a support platform 7.

The conveyor belt for rotates anticlockwise about the rollers 5 when the apparatus 1 is viewed as shown in the drawings.

In accordance with a 1st example of the invention, the chute 2 discharges a medicine bottle 3 on the receiving end of the conveyor belt 4. As the conveyor belt 4 rotates, the bottle 3 moves in between alignment plates 11. The alignment plates 11 are elongate in the direction of the conveyor belt 4 and face each other from opposing sides of the conveyor belt 4. An alignment actuator rod 14 is selectively movable into and out of an alignment actuator housing 12 between a retracted position and an extended position. An operatively inner end of the alignment actuator rod 14 is attached to a rear surface of each alignment plate 11 so that movement of the alignment actuator rod 14 moves the plate 11 from a side of the conveyor belt 4 towards a centre thereof. Alignment movement support rods are attached on either side of the alignment actuator rod 14 to the alignment plates and are movable together with the alignment plates 11 in alignment movement support blocks 13. This supports the alignment plates so that they do not rotates about their connection with the alignment actuator rod or so that they do not cause rotation of the alignment actuator rod with-in the alignment actuator housing.

The arrows 28 shown in figure 3 show the direction of movement of the plate 11 from their retracted to their extended positions.

A further device, in the form of a label applicator 15, is next in line in the direction of movement of the top portion of the conveyor belt. The label applicator 15 includes a label applicator arm 16 that receives, in use, a label from a label roll and a printer (not shown) on a label applicator plate 17, at a free end of the label applicator arm 16.

The label applicator arm 16 is movable from a retracted position in which it locates mostly with in the label applicator 15 to an extended position as shown in figure 4.

The next device, in the direction of movement of the top section of the conveyor belt 4, is a sponge movement apparatus supported in a support beam 26 the sponge movement apparatus includes a sponge support plate 24 at the end of a sponge arm 27. The sponge arm 27 is movable from a retracted position in which it allows the movement of articles freely along the conveyor belt 4 to extended position in which a sponge 25 on the operatively underside of the sponge support plate 24 is pressed onto an article, such as the medicine bottle 3, to be labelled.

A further device is supported on the beam 26, further down in the direction of movement of the upper portion of the conveyor belt. This device is a suction apparatus 38 having a suction cup 379 movable between a retracted position in which it allows free, unimpeded movement of articles on the conveyor belt and an extended position in which a suction cup 37 or suction means ~~37~~ at a free end of the suction arm 39 ~~Duchess~~ touches an article such as a plastics material sachet 36 and engages it for applying a vacuum through the suction cup 37 and up the arm of the suction apparatus 38.

A still further device in the form discard the wise includes a discard plate 19 located underneath to the side of the suction device. The discard device includes a discard plate 19 which is elongate and orientated in the direction of the conveyor belt 4, coaxially there with and to the side of the conveyor belt so that, in a retracted position it allows free movement of articles on the conveyor belt 4. The discard support rod ~~21~~ 22 is attached behind the discard plate and discard plate movement support rods 23~~3~~ located on either side of the

discard supporter rod 22 and on movable in discard support blocks 20 to ensure steady movement and prevent rotation of the plate 19 when the discard support rod ~~28~~ 22 is extended from a retracted position to an extended position in which the plate has moved across the conveyor belt towards the discard shoot 8 thus to push an article moving or, in the case of the conveyor belt being at standstill, off the conveyor belt and onto the discard shoot 8 from where it can be discarded into a discard receptacle.

The dispensing container 9 is located and attached to a pharmaceutical dispenser unit front cover 10. The dispensing container can be accessed through a trapdoor from an operatively front side of the pharmaceutical dispensing unit (PDU) as is described further below.

The front cover 10 of the PDU includes a user interface and communication means in the form of a screen 31 a keyboard 32 a card reader slot 34 a speaker 33 and a microphone (not shown). The flat door 30 is operable from a front side of the PDU and is normally locked. The flat door is unlocked and access to the dispensing container is allowed once a patient has been positively identified and once it is confirmed that the correct medicine has been dispensed into the dispensing container.

In a 2nd example, and as shown in figure 12, a sachet 36 moves along the conveyor belt 4 in a sachet dispensing box 35 which has been dispensed by dropping the dispensing box 35 down the chute so that it lands with its open end facing upwards on the conveyor belt and then moves along the conveyor belt as described in more detail below.

In in use, and with reference 1st to figure 1, a bottle 3 is deposited from the chute onto the receiving end of the conveyor belt. The bottle will not necessarily align lengthwise on the conveyor belt 4 or transverse to the conveyor belt 4. To ensure proper alignment of the bottle the alignment plate 11 move closer together and force the bottle alignment as is shown in figure 2. The conveyor belt 4 may include a centrally extending recess (not shown) to support the bottle and to prevent it from rolling to the size of the conveyor belt 4. As shown in figure 3, the bottle is now moved to underneath the label applicator and a label 29 having an adhesive operatively underside is pushed onto the ~~bottom~~ bottle 3 as is shown in figure 4. In figure 5, the label applicator has moved to its retracted position and the label is attached to the bottle albeit only at the central portion of the label 29 opposite ends of the label have not been pushed down onto the curvature of

the bottle. As is shown in figure 6, the bottle 3 now moves to a position underneath the sponge 25 and the device that operates the sponge pushes the sponge downwards as is shown in figure 7 and onto, as is shown in figure 8, the bottle 3. This movement forces the sponge 25, which is of course resiliently deformable to deform according to the shape of the curvature of the bottle 3 and it causes the label to be forced properly onto the curvature of the bottle 3.

At this point, if a barcode or other reader such as a camera having character recognition facilities, the discard plate 19 may be actuated to discard the bottle down the discard shoot 8 if it is determined that the incorrect medicine or dosage is about to be dispensed. If however it is confirmed that the correct medicine is about to be dispensed the bottle now moves further along the conveyor belt 4 from where it falls from the discharge end of the conveyor belt 4 into the dispensing container 9 where it is ready for collection by a patient once the patient has performed the necessary actions at the front end of the PDU. This process of dispensing the medicine is known and the medicine will only be dispensed once the patient has been positively identified and other requirements such as payment for the medicine is confirmed. In the dispensing process, access to a pharmacist may also be established through use of the communication means of the PDU which may even include a video link.

As shown in figure 12, a sachet 36 made of plastics material and including medicament is dispensed inside a sachet dispensing container or box 35, down the chute 2, onto the receiving end of the conveyor belt. The dispensing box 35 may or may not be orientated on the chute using the alignment plates 11. The alignment otherwise of the box will depend on the size of the label to be adhered to the sachet. Once the label 29 is attached with the label attachment means and once the sponge 25 has been activated to ensure proper adherents of the label to the uneven surface (due to the medicament inside of the sachet) of the sachet 36 by pushing down on the sachet 36 and label and deforming to conform with the uneven surface of the sachet, the suction cup 37 is moved onto the sachet from where vacuum ~~means~~ apparatus 38 suction cup 37 and suction arm 39 ensure that the sachet remains attached to the suction cup 37 as the suction cup is moved upwards away from the dispensing box 35. Once the sachets moved out of the box, the discard plate 19 is moved forward across the conveyor belt to push the dispensing box 35 to the side and onto the ~~dispensing~~ discard chute 8. The box ~~does~~ then travels down the inclined ~~dispensing~~ discard chute 8 into a collection receptacle from where it may be reused.

Sensors in the form of barcode readers and all cameras having character recognition software may be used at various intervals along the path of travel of the article to be labelled to ensure that the correct medicament is dispensed, that the and the like. If the incorrect medicament is about to be dispensed or if the incorrect information is displayed on the label 29, the discard plate 19 will be activated to move any such article off the conveyor belt 4 and down the discard chute 8.

It is envisaged that the invention described herein will be convenient to use in that sachets may be dispensed using open topped rectangular boxes, suction or vacuum means and a discard means for discarding the boxes from the conveyor belt. Once the box has been moved off the conveyor belt, the vacuum force is released so that the sachet drops back onto the conveyor belt from where it moves to the discharge end of the conveyor belt and falls into the dispensing container.

Labels are also securely attached to articles such as boxes, sachets having uneven surfaces and bottles having curved surfaces through use of the resiliently deformable sponge that, once a label is partially attached to an article, pushes the label further onto the article and such articles uneven or curved or angled surface. In the case of a box having a flat surface, the sponge is also useful to apply additional pressure which may not have been sufficiently applied by the label applicator.

It will be appreciated by those skilled in the art that the invention is not limited to the precise details as described herein. For example, labels may be attached to other types of packaging instead of bottles and sachets as described herein. For example, labels may also be attached to cardboard and other material boxes and the like.

CLAIMS

1. A ~~labelling apparatus~~pharmaceutical dispensing unit comprising a conveyor means having:

   a receiving end for receiving an article to be labelled~~; and~~

   a discharge end for discharging the article once labelled~~,~~

   a label applicator for attaching a label to the article; and

   ~~a~~ ~~label securing means~~resiliently deformable object for securely forcing the label onto the article,

   the discharge end terminating at a dispensing container for discharging the article after the article has been labelled into the dispensing container wherein the dispensing container is accessible from a front of the pharmaceutical dispenser unit so that a patient can remove the article from the dispensing container.

2. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in claim 1 in which the article has a curved, uneven, angled or flat surface.

3. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which the article is a bottle, box or sachet.

4. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which the article is a container that contains a medicament.

5. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which the conveyor means is a continuous conveyor belt extending around rollers at opposite ends of the conveyor means.

6. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which the label applicator includes an applicator arm movable between a retracted position in which it receives the label at the free end of the arm and an extended position in which an adhesive side of the label is pushed onto the article.

7. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which the ~~label securing means is a~~ resiliently deformable object is movable between a position removed from the article ~~to~~ and a position in which it is forced onto the label and the article so that it deforms to take the shape of an exposed side of the article to force the label to securely attach to the article.

8. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in claim 7 in which the resiliently deformable object is made from foam rubber or is a sponge.

9. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in ~~any one of the preceding claims~~claim 3 in which a suction means is movable between an engagement position in which it engages the sachet in a container and a retracted position in which the sachet is attached to the suction means and moved out of the container.

10. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in claim 9 in which a discard apparatus pushes the container off the conveyor when the suction means is in its retracted position.

11. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in ~~any one of~~ claims 9 or 10 in which the suction means releases the sachet when the suction means is in its retracted position and when the container is removed from the conveyor so that the sachet falls onto the conveyor.

12. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which the conveyor receives the article at the receiving end, the receiving end terminating underneath a discharge end of a delivery chute~~receiving in its operatively underneath a discharge end of a delivery chute for receiving the article on the receiving end of the conveyor~~.

~~13. An apparatus as claimed in any one of the preceding claims in which the discharge end of the conveyor terminates at a dispensing container for discharging the article, once labelled, into the dispensing container.~~

~~14.~~13. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in claim ~~13~~ 12 in which the dispensing container includes a trapdoor ~~which trapdoor is located in a front cover of a pharmaceutical dispenser unit~~.

~~15.~~14. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in claim ~~14~~ 13 in which the pharmaceutical dispensing unit also includes a patient interface in the front cover thereof.

~~16.~~15. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in claim 14~~15~~ in which the patient interface includes a screen and communication means having a microphone and a speaker, a keypad and a card reader.

~~17.~~16. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which ~~the article is moved along~~ the conveyor moves the article along ~~to operatively~~ underneath the label applicator for attaching a label and then to underneath the ~~label securing means~~resiliently deformable object for securely forcing the label onto the article.

~~18.~~17. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which alignment means align ~~and~~ the article to be labelled on the conveyor means before a label is applied to the article.

~~19.~~18. ~~An apparatus~~A pharmaceutical dispensing unit as claimed in any one of the preceding claims in which a suction device is located above the conveyor means and which suction device includes a suction cup movable onto the article to attached to the article through negative vacuum pressure and to lift the article away from the conveyor means by moving the suction cup away from the conveyor means.

~~20.~~19. A labelling method comprising the steps of:

- receiving an article to be labelled on a conveyor means;
- moving the article, on the conveyor means, to ~~operatively~~ operate underneath a label applicator;
- attaching a label, at least partially, to the article;
- forcing, with a label securing means, a ~~major part~~portion of the label onto the article; and
- discharging the article into a dispensing container or box.

~~21.~~20. A method as claimed in claim ~~20~~ 19 in which the method includes the step of aligning the article on the conveyor means.

~~22.~~21. A method as claimed in ~~any one of~~ claims ~~20~~ 19 ~~to~~ or ~~21~~ 20 in which the method includes applying a suction force to the article to lift the article out of ~~a~~ the dispensing container or box and to release the suction force from the article to drop the article back onto the conveyor means once the dispensing container or box has been moved off the conveyor means.

~~23.~~22. A method as claimed in any one of claims ~~20~~ 19 to ~~22~~ 21 including the step of forcing an incorrect article, and article having been incorrectly labelled or the~~a~~ dispensing container or box off the side of the conveyor means.

23. A labelling apparatus comprising a conveyor belt having:

a receiving end for receiving an open top dispensing box with an article to be labelled therein;

a discharge end for discharging the article;

a label applicator for attaching a label to the article;

a resiliently deformable object moveable to securely force the label onto the article;

a suction cup movable between an engagement position in which it engages the article in a dispensing box and a retracted position in which the article is attached to the suction cup and moved out of the dispensing box; and

a discard apparatus that pushes the dispensing box off the conveyor belt after which the suction cup releases the article so that the article falls back onto the conveyor.

24. An apparatus of claim 23 wherein the article has a curved, uneven, angled or flat surface.

25. An apparatus as claimed in claims 23 or 24 wherein the article is a bottle, box or sachet.

26. An apparatus as claimed in any one of claims 23 to 25 wherein the article is a container that contains a medicament.

27. An apparatus as claimed in any one of claims 23 to 26 wherein the conveyor belt is a continuous conveyor belt extending around rollers at opposite ends of the conveyor belt.

28. An apparatus as claimed in any one of claims 23 to 27 wherein the label applicator includes an applicator arm movable between a retracted position in which it receives the label at the free end of the arm and an extended position in which an adhesive side of the label is pushed onto the article.

29. An apparatus as claimed in any one of claims 23 to 28 wherein the resiliently deformable object is movable between a position removed from the article to a position in which it is forced onto the label and the article so that it deforms to take the shape of an exposed side of the article to force the label to securely attach to the article.

30. An apparatus of claim 29, wherein the resiliently deformable object is made from foam rubber or is a sponge.

31. An apparatus of claim 25, further comprising a suction cup movable between an engagement position in which it engages the sachet in a dispensing box and a retracted position in which the sachet is attached to the suction cup and moved out of the dispensing box.

32. An apparatus as claimed in any one of claims 23 to 31 wherein the conveyor belt receives the article at the receiving end, the receiving end terminating underneath a discharge end of a delivery chute.

33. An apparatus as claimed in any one of claims 23 to 32 wherein the discharge end of the conveyor belt terminates at a dispensing container for discharging the article, after the article is labelled, into the dispensing container.

34. An apparatus of claim 33, wherein the dispensing container includes a trapdoor located in a front cover of a pharmaceutical dispenser unit.

35. An apparatus of claim 34, wherein the pharmaceutical dispensing unit includes a patient interface in the front cover thereof.

36. An apparatus of claim 35, wherein the patient interface includes a screen, a microphone a speaker, a keypad and a card reader.

37. An apparatus as claimed in any one of claims 23 to 36 wherein the conveyor belt moves the article along underneath the label applicator for attaching the label and then underneath the resiliently deformable object for securely forcing the label onto the article.

38. An apparatus as claimed in any one of claims 23 to 37 wherein one or more alignment plates, an alignment actuator rod, an alignment actuator housing, and one or more alignment movement support blocks align the article to be labelled on the conveyor belt before a label is applied to the article.

~~24.~~39. An apparatus as claimed in any one of claims 23 to 38 wherein a suction device is located above the conveyor belt and which suction device includes a suction cup movable onto the article to attached to the article through negative vacuum pressure and to lift the article away from the conveyor belt by moving the suction cup away from the conveyor belt.