

# UK Patent Application

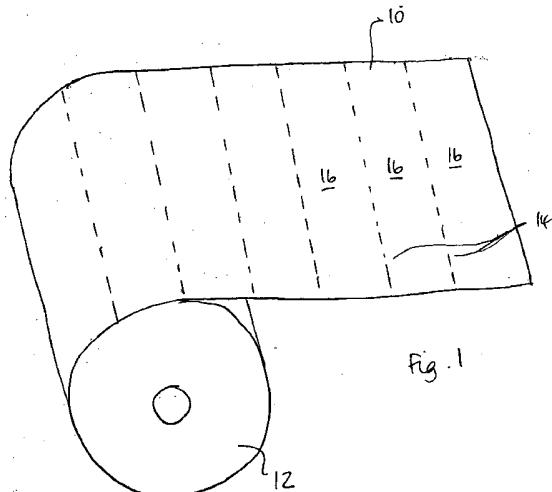
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(54) Abstract Title: **Label roll and plant**

(57) A label 16 roll 12 has the longer of two edge dimensions extending across the width of the roll 12. In this manner the circumferential size of the roll may present as smaller than a roll with the labels mounted longitudinally. The roll may be linerless, with labels being cut by a guillotine prior to being attached to items passing on a conveyor. Also disclosed is a label applying machine in which a label is separated from a roll, then transported at right angles to the original direction of travel to a label application station (fig.3).



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 2007.

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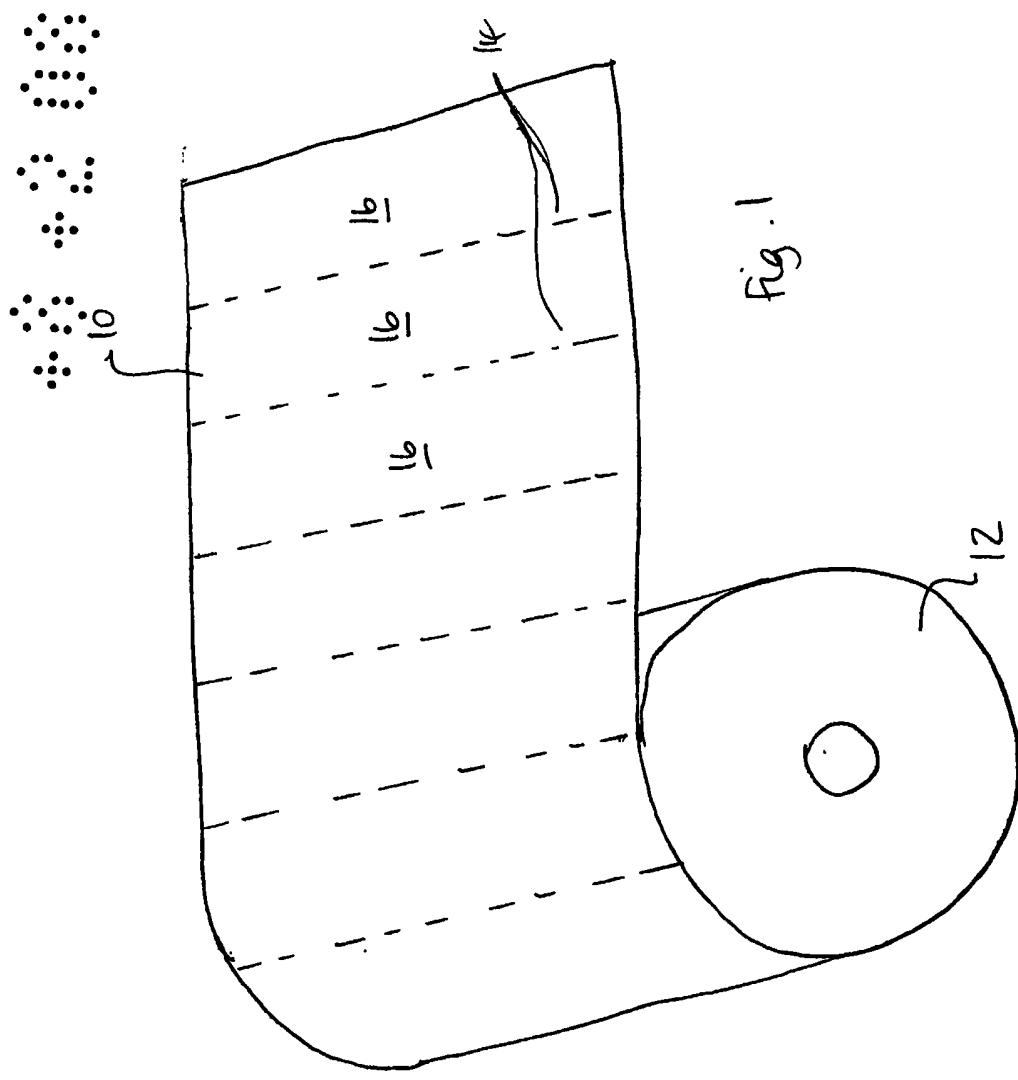


fig. 1

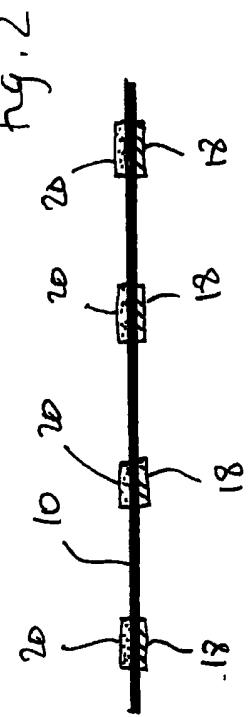


fig. 2

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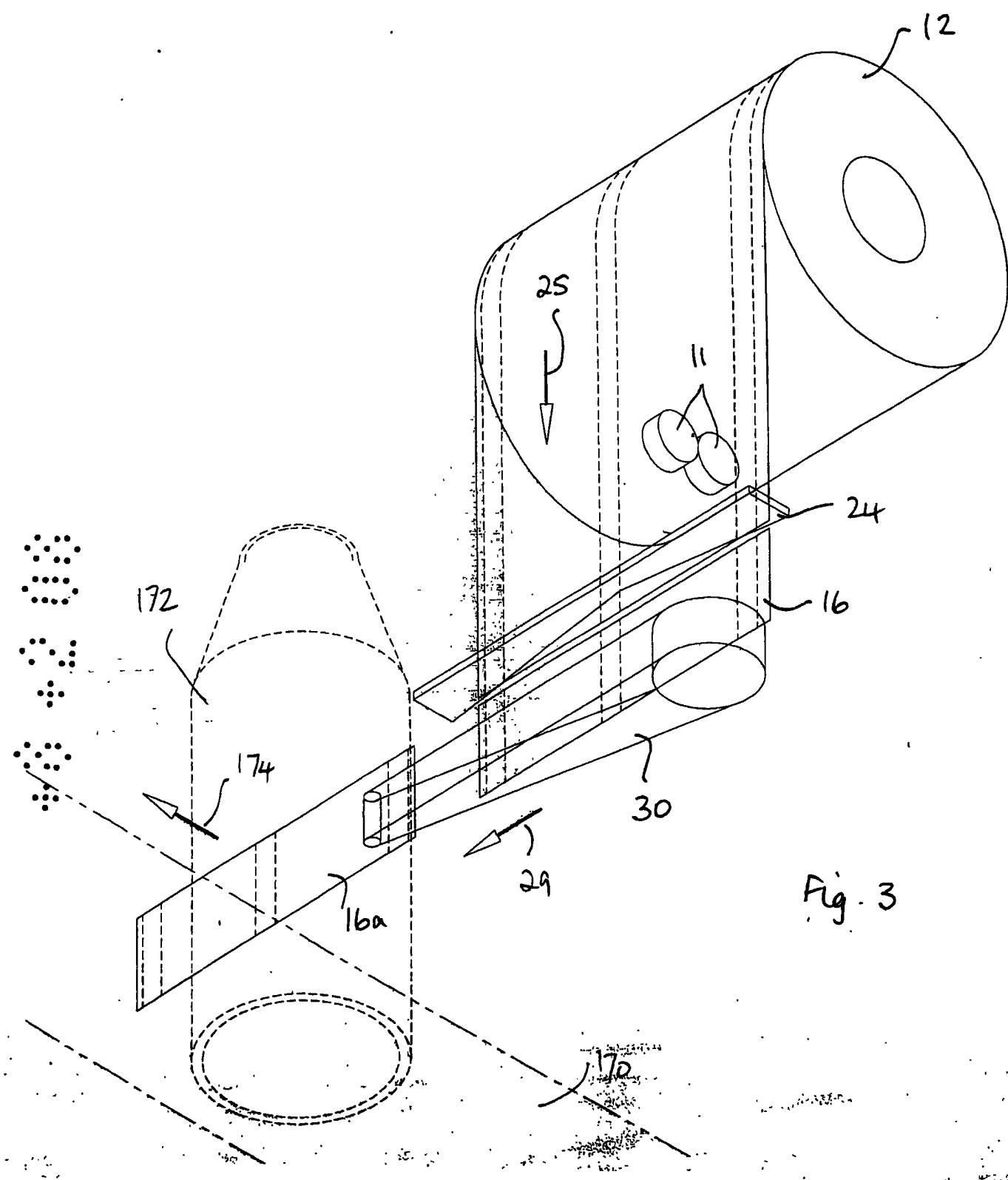


Fig. 3

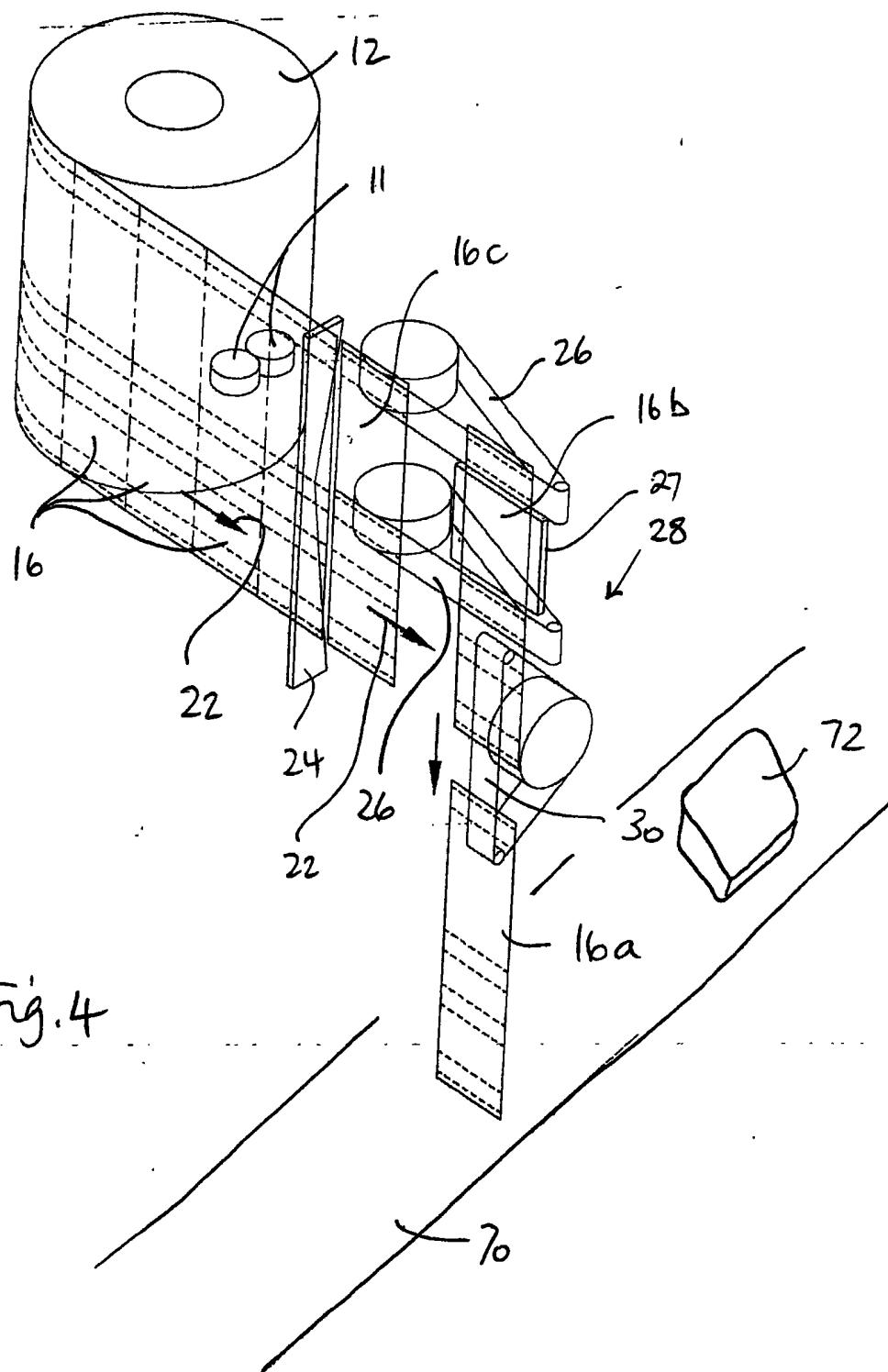


Fig. 4

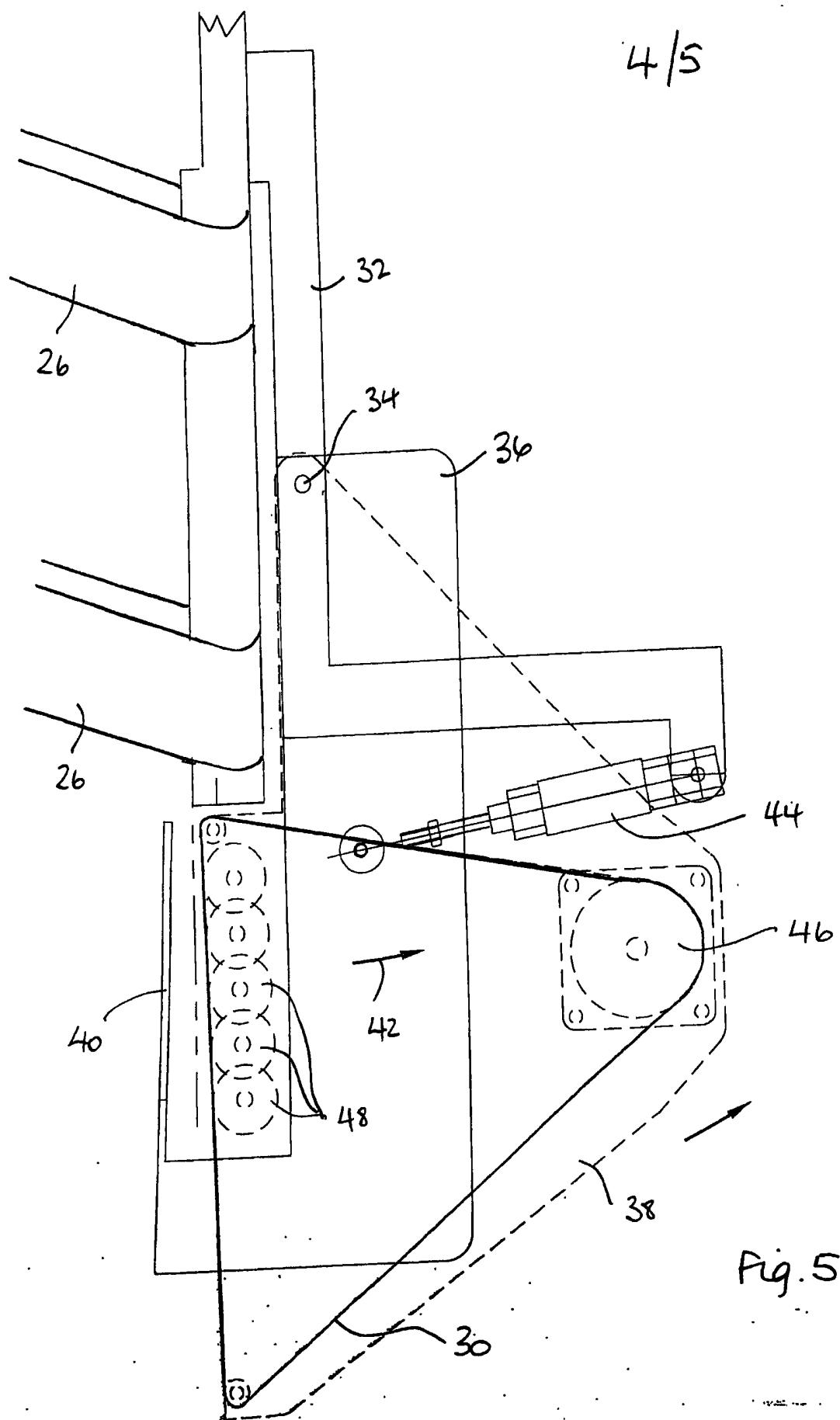


Fig. 5

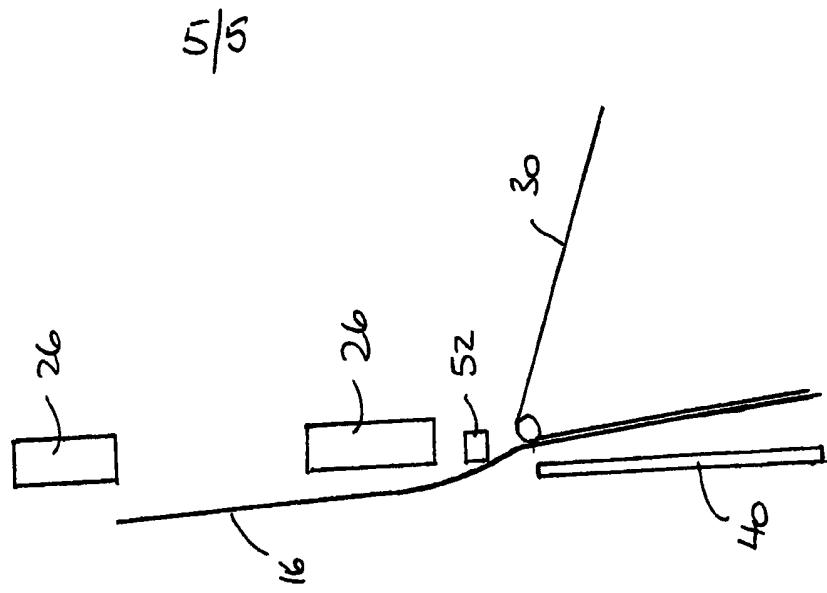


Fig. 6c

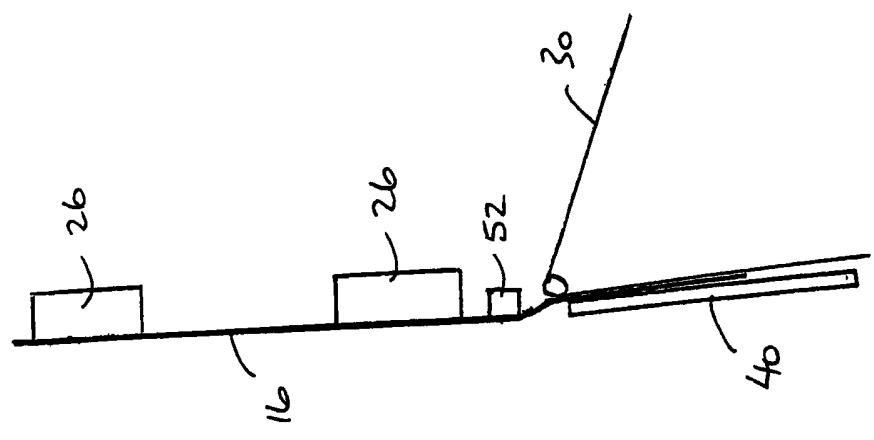


Fig. 6b

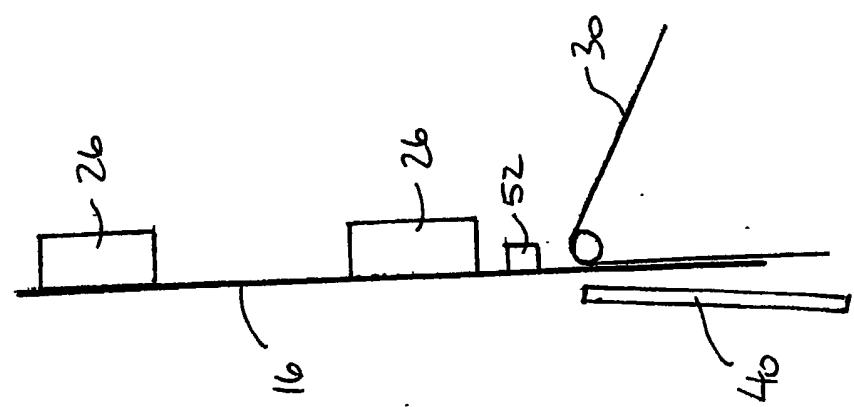


Fig. 6a

## Labelling Machine

This invention relates to labelling, in particular applying self-adhesive (pressure sensitive) labels to packages. Typically the packages will be foodstuffs packages  
5 (solid and/or liquid). The invention relates to a machine for applying such labels, and to labels supplied in roll form.

Labelling machines typically are fed with labels from a continuous roll of labels which will have been printed at a remote location. The roll of labels will be loaded  
10 in the labelling machine. The packages to be labelled will travel on a conveyor through the labelling machine and as they pass a label application station, a label will be detached from the roll and applied to the package.

The roll of labels can be provided on a backing liner from which they are separated  
15 as they are applied to a package, or the roll can be of "linerless" labels where the adhesive on the back of the labels is in alignment with a transparent silicone or other release layer printed on the front of the labels.

20 This invention is particularly applicable to labels which have a first dimension which is greater than a second dimension at right angles to the first dimension. For example, such labels may be rectangular with length greater than the width.

It is conventional for a label to be fed (at the label application station) so that the narrow edge of the label is the first to make contact with the package, and as the  
25 package moves past the label application station, the leading edge of the label adheres to the package and as the package moves forward, the rest of the label is drawn from the label feed mechanism and pressed against the package surface so that the label is applied to the package as the package moves through the label application stage. As a result of this process, the labels have to be fed "narrow in  
30 edge first" and a consequence of this is that the roll of printed labels is narrow in width. Because the long dimension of the label runs along the length of the roll, the roll is relatively large in diameter.

According to the invention, there is provided a roll of self-adhesive labels in the form of a continuous web, wherein each label has a major and a minor dimension, and the major dimension of the labels extends across the width of the roll.

5

The labels may be rectangular in form with the wide edge of each label leading as the web is drawn off from the roll.

Preferably the labels are "linerless" labels.

10

The invention also provides a machine for applying labels, the machine comprising means for supporting a reel of web-based labels, first transport means for transporting the labels as part of the web in a first transport direction to a separating station where the leading label is separated from the web, and second transport means for transporting the separated label in a second transport direction at right angles to the first transport direction to a label application station.

15. The second transport means preferably includes a belt to which the adhesive of the label can be lightly tacked to hold the label while it moves in the second transport direction.

20. The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:

25

Figure 1 is a perspective view of a roll of linerless labels;

Figure 2 is an edge view of the web of Figure 1;

30

Figure 3 is a schematic representation of a label transport path in a first embodiment of the invention;

Figure 4 is a schematic representation of a label transport path in a second

embodiment of the invention

Figure 5 shows details of the label transfer station from Figure 4; and

5 Figures 6a, 6b and 6c show, in cross-section, label transfer taking place.

Figure 1 shows one end of a web 10 which is wound on itself to form a roll 12. The web is printed on one or both sides with label information in a repeating way such that the web can be divided into individual labels to be applied to individual  
10 packages.

In Figure 1, dotted lines 14 show where the web will be separated into individual labels. It will be seen therefore that each label 16 has a long dimension (which extends across the width of the roll 12) and a short dimension at right angles to  
15 this long dimension.

16 The web 10 shown in Figure 1 is a web of linerless labels. The web is a single  
17 sheet which (in addition to the printed visual information) is "printed" on one side  
18 with strips of adhesive and on the other side with strips of silicone release agent.  
19 The release agent is transparent and is printed over the visual information and will  
20 not obscure any of that information. This is illustrated in Figure 2 where the  
21 adhesive is shown at 18 and the silicone at 20. When the web is wound to form  
22 the roll 12, the adhesive 18 on the underside of the web will come into contact with  
23 the silicone on the top of the web, so that the web can be easily unrolled from the  
24 roll.

25 It is a characteristic of linerless labels that the web 10 will be a single continuous web and, just before label application, the web can be slit using a guillotine or the like to separate the leading label from the rest of the web. The invention is not  
30 however restricted to linerless labels, and the operation to be described in the following description would work equally well for labels mounted on a backing sheet where the labels would be detached from the backing sheet before

application to a package, and the backing sheet would then be processed separately.

With the web 10 designed so that the long edge of each label leads, more labels 5 can be provided on a roll of a given diameter, when compared with a roll of the same labels set up so that the narrow edge leads. Thus there would be less downtime caused by changing any empty roll for a full roll.

Figure 3 shows an embodiment where the roll 12 is mounted on a horizontal axis 10 and the web is drawn off the roll by rollers 111 in a downward direction as indicated by arrow 25. The web passes directly to a blade 24 where each label 16 is separated from the web. A separated label 16 is then picked up by a belt 30 through a light adhesion of the adhesive 18 to the surface of the belt 30 and transported, with the belt, in a horizontal direction 29 into the path of a bottle 172. 16. moving in the direction of an arrow 174 and standing upright on a conveyor 170. 17. In this Figure, the reader is looking upwards from a position below the conveyor 170. The leading end of the label 16a then attaches itself to the bottle 172 and as 18. the bottle moves on, the label is drawn off from the belt 30 and swept around the 19. surface of the bottle by suitable wipers so that the label ends up wrapped around 20. the bottle.

Figure 4 shows an alternative embodiment where the roll 12 is mounted on a vertical axis and the web is fed from the roll, in a vertical plane, initially by rollers 11. The roll is advanced in a first direction indicated by arrows 22. Registration 25 marks are printed on the back of the roll, one for each label. The registration marks are sensed by a sensor and trigger a cutting operation to separate the leading label from the web. The cutting takes place at a schematically shown guillotine blade 24 where the web is separated into individual labels. In Figure 3, separated labels are shown at 16a, 16b and 16c.

30 In this embodiment, variable print information (for example pack weight) is applied to each label by a printing head located at label position 16b. At this position, a

backing plate 27 supports the label as the print is applied.

The labels are picked up by two cross transport belts 26 and conveyed to a transfer area 28 where they are transferred to a vertical transport belt 30. The 5 transfer of the labels from the cross transport belts to the vertical transport belt will be described in more detail with reference to Figure 4 and 5.

Figure 5 shows some of the structure at the transfer station 28. A frame 32 supports the end rollers of the transport belts 32 and has a pivot mounting 34 on 10 which both a pressure plate 36 and a carrier plate 38 (shown in dotted lines) for the vertical transport belt 30 are mounted. The pressure plate has a pressure finger 40, and the plate can be moved in the direction indicated by the arrow 42, under the influence of an operating cylinder 44.

- 16. The carrier plate 38 also carries a driven pulley 46 which drives the belt 30, and a series of idler support rollers 48.
- Figures 6 show how a label 16 is transferred from the cross transport belts 26 to the vertical transport belt 30.
- 20. As each label moves to the right (as seen in Figure 4), the bottom edge 50 of the label extends below the lower belt 26, and overlaps with the top of the vertical belt 30 by sufficient distance to ensure that the lowermost strip of adhesive 18 overlaps the belt. At this stage, the label is still adhered (with a light tack) to the belts 26 25 (Figure 6a).

Next, the pressure plate 36 with its finger 40 is activated to be rotated anti-clockwise so that the top end of the finger 40 presses the bottom edge 50 of the label against the vertical belt 30. The belt on its carrier plate also swings about the 30 pivot 34, and the label is pulled against a fixed bar 52. The effect of this movement is to produce a small force in the lower half of the label tending to detach the label from the lower belt 26 (Figure 6b)

As the vertical belt 30 continues to rotate, so the label is wholly detached from the belts 26, and is moved downwards on the belt 30. The finger 40 moves back at this point (Figure 6c)

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The apparatus shown in Figures 4 and 5 is particularly suitable for applying so called C-labels which wrap around three sides of a package. These labels are relatively long in length compared to their width. The invention is however equally suitable for labels which are entirely applied to one face of a package or even to 10 wrap-around labels (eg bottles as in Figure 3).

The material of the transport belts will be chosen to afford a light tack contact between the adhesive on the web and the belt material, without any significant amount of the adhesive remaining on the belt after the label has been detached.

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Claims

5    1. A roll of self-adhesive labels in the form of a continuous web, wherein each label has a major and a minor dimension, and the major dimension of the labels extends across the width of the roll.

10    2. A roll of labels as claimed in Claim 1, wherein the labels are "linerless" labels.

3. A roll of labels as claimed in Claim 1 or Claim 2, wherein the labels are rectangular and a wide edge of each label leads as the web is withdrawn from the roll.

15. 4. A machine for applying labels, the machine comprising means for supporting a reel of web-based labels, first transport means for transporting the labels as part of the web in a first transport direction to a separating station where the leading label is separated from the web, and second transport means for transporting the separated label in a second transport direction at right angles to the first transport direction to a label application station.

20. 5. A machine as claimed in Claim 4, wherein the second transport means includes a belt to which the adhesive of the label can be lightly tacked to hold the label while it moves in the second transport direction.

25. 6. A machine as claimed in Claim 4 or Claim 5, including printing means for printing variable information on the labels prior to application of the labels to a package.

30. 7. A roll of self-adhesive labels substantially as herein described with reference to the accompanying drawings

8. A machine for applying labels substantially as herein described with reference to the accompanying drawings.

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**Application No:** GB0800644.7

**Examiner:** Mr Michael Young

**Claims searched:** 1-3

**Date of search:** 22 February 2008

## Patents Act 1977: Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1,2,3	US 6585437 B1 (WIKLOF) Linerless label 101 roll 302 with long leading, fig.3 & corresponding passages.
X	1,2,3	EP 1407994 A1 (PAXAR..) Linerless label (L) roll (R) with long leading edge, fig.1 & corresponding passages.
X	1,2,3	US 5725719 A (JANUSZ..) Linerless label 32 roll 30, with long leading edge, fig.1 & corresponding passages.
X	1,3	US 7220333 B1 (BETHUNE) Label 7 roll 4, with long leading edge (applied to bottle 8), fig.1 & corresponding passages.
X	1,3	WO 2005/119631 A3 (FUJI) Label 10 roll 12, with long leading edge, fig.1 & corresponding passages.
X	1,3	EP 0811477 A1 (GPE..) Label 6,7,8 roll 1, with long leading edge 2, fig.1 & corresponding passages.

### Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

Worldwide search of patent documents classified in the following areas of the IPC

B31D; B65C; G09F

The following online and other databases have been used in the preparation of this search report

WPI EPDOC

### International Classification:

Subclass	Subgroup	Valid From
G09F	0003/02	01/01/2006
B31D	0001/02	01/01/2006
B65C	0009/18	01/01/2006