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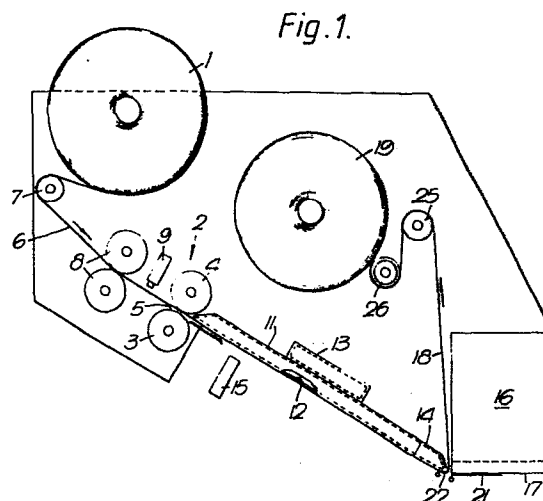
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(54) Labelling apparatus and method.

(57) The invention provides a labelling apparatus and method wherein label material (6,31) from a roll (1) thereof is fed to cutter means (2) where labels (21,32) are cut in the label material, the labels are transported in the cut label material over stationary support means (11,27) having vacuum means (13,29) for maintaining the cut label material in contact therewith, adhesive is applied to the labels (21,32) whilst the cut label material is supported on the stationary support means (11,27) and means (24,35) is provided for applying the labels (21,32) with adhesive thereon to articles to be labelled at a label applying station.



LABELLING APPARATUS AND METHOD

This invention relates to a labelling apparatus and method.

Most labelling systems in general use at the present time utilise pre-gummed labels, i.e., labels which have previously been coated with an adhesive. Such pre-gummed labels are very expensive compared to plain paper labels, i.e., labels which have not been pre-coated with adhesive.

The present invention has as its object to provide a labelling apparatus and method which utilises relatively cheap plain paper labels cut from a roll of label material and which comprises simple but effective means for transporting the labels.

The present invention provides labelling apparatus comprising a supply of label material in the form of a roll of that material, a cutter unit to which the label material is fed from the roll for labels to be cut in the label material, stationary support means for the cut portion of the label material, an adhesive applying station operable to apply adhesive to the labels whilst the cut portion of the label material is supported by the stationary support means, a label applying station, means for moving the cut portion of the label material to which adhesive has been applied from the adhesive applying station to the label applying station over the stationary support means, means for successively transporting articles to be labelled to the label applying station, and means at the label applying station for applying the labels with adhesive thereon to the articles. The apparatus may comprise rewind means to which the web or matrix from which the labels have been cut is attached for rewinding.

The present invention also provides a method of applying labels to articles comprising the steps of feeding label material from a roll thereof to cutter means operable to cut labels in the label material, feeding the cut label material to stationary support means, applying adhesive to the labels whilst the cut label material is supported by the stationary support means, feeding the cut label material having adhesive applied to the labels over the stationary support means to a label applying station, and applying the labels with adhesive thereon to the articles at the label applying station.

The cut label material may be retained in engagement with the stationary support means by vacuum means as it moves thereover. The labels to which adhesive has been applied may be applied to the articles by first peeling the labels from the remainder of the label material and then applying them to the articles. Alternatively, the labels may be applied to the articles directly from the label material as the latter reaches the label applying station. In this case, air jets may be provided in the stationary support means at one or more predetermined locations for blowing each label from the remainder of the label material to the required article. Thus the stationary support means forms part of the label applying station.

The means for applying adhesive to a surface of each label may be of any suitable kind and may comprise, for example, one or more spray nozzles for spraying adhesive onto a surface of each label or one or more jet printing nozzles.

Where the adhesive is applied using one or more jet printing nozzles then these may be of the drop-on-demand or continuous drop kind. Where the jet printing means is of the drop-on-demand kind then it may comprise a plurality of jet printing

nozzles each of which is adapted to direct single individual droplets of adhesive onto said surface of a label and control means for selectively and individually controlling said nozzles so that
5 droplets of adhesive can be directed onto said surface of a label in a required predetermined pattern. If the jet printing means is of the continuous kind then the means may comprise one or more nozzles each adapted to produce a continuous
10 single stream of droplets of adhesive and electrostatic or other suitable means for directing the individual droplets of adhesive to selected positions on a said surface of a label or to a drain or gutter.

15 According to a preferred embodiment of the present invention the adhesive applying means comprises means for directing a continuous stream of drops of a said liquid in a direction to traverse and not impinge on a surface to which the
20 liquid is to be applied, means for effecting relative movement between a said stream of drops and a said surface in a direction perpendicular to the direction of travel of the stream of drops, means for selectively electrically charging the
25 drops of liquid in said stream, and means for establishing a steady electric field about the path of travel of said stream of drops for deflecting the electrically charged drops onto said surface.

The means for applying the labels with
30 adhesive thereon to said articles may be of any suitable kind and may comprise, for example, a plurality of air jets for blowing the labels onto the articles, a wrap-around belt, suitable reciprocating means, or the like.

35 Further transport means may be provided for transporting the labels with adhesive thereon from said adhesive applying station to said label applying station.

Labelling apparatus in accordance with the invention will now be described in greater detail, by way of example, with reference to the accompanying drawings, in which:-

5 Figure 1 is a diagrammatic side view of the apparatus,

Figure 2 is a view to a larger scale of a portion of Figure 1,

Figure 3 is a view generally similar to that
10 of Figure 2 but showing an alternative embodiment, and

Figure 4 is a view from below of Figure 3.

Referring to Figures 1 and 2, the labelling apparatus comprises a roll of label material 1
15 which may be plain paper, a cutter unit 2 in the form of a pair of rollers 3, 4, the roller 3 being profiled at 5 to cut the desired label shape in the web of label material 6 on being fed from the roll 1 to the cutter unit 2. The web 6 is taken from
20 the roll 1, around a guide roller 7 and between a pair of pinch drive rollers 8 to the cutter unit 2. A print registration sensor 9 is provided immediately prior to the cutter unit 2 as is conventional.

25 From the cutter unit 2 the web of cut label material is taken to stationary support means in the form of a box 11 which is closed save for a perforate front plate 12 over which the cut label material moves. The pressure within the box 11 is
30 held below atmospheric pressure by a suction fan unit 13, whereby the cut label material is held in engagement with the outer face of the front plate 12. The box 11 has an end portion 14 which is
35 removable in order that an end portion of a size appropriate to the size of label being handled can be employed. An adhesive applying station 15 is provided having means for applying adhesive to the

labels whilst the latter are in engagement with the box front plate 12.

A grid and air jet assembly 16 is located closely adjacent the end portion 14 of the box 11, the grid 17 of the assembly receiving the individual labels as they are peeled from the cut portion of label material, the remaining web portion or matrix 18 of label material being attached to a driven roll 19 which serves not only to rewind the matrix but also to transport the cut portion of label material over the front plate 12 of the box 11. The labels, such as indicated at 21 in Figure 1, are peeled from the cut portion of the label material by virtue of the matrix 18 being taken around a relatively small diameter roller 22. In as much as a label when peeled from the matrix 18 will tend to curl downwardly from the leading edge, two air jets 23 are provided to prevent this curling and to assist in the transfer of the label to the grid 17 on which it is held by vacuum in the conventional manner. Also in a conventional manner, air jets 24 (Figure 2) of the assembly 16 are positioned in a predetermined manner such that when actuated, the label 21 is blown from the grid 17 to an article (not shown) which is brought close to the label. Thus the grid and air jet assembly 16 forms part of a label applying station.

The matrix 18 is taken to the rewind roll 19 from the peeler roller 22 via two rollers 25 and 26 one or both of which may be a tension roller.

Turning now to Figures 3 and 4, there is shown a portion of an alternative embodiment, Figure 3 being a view generally similar to that of Figure 2, namely a view of the end portion of the stationary support means. In this embodiment the air jet and grid assembly 16 is dispensed with and the end portion of the stationary support means forms part of the label applying station. The

stationary support means is in the form of a box 27
as in the embodiment of Figure 2 and is again
closed save for a perforate front plate 28. The
box 27 is shown horizontal rather than inclined as
5 in Figures 1 and 2.

A suction fan unit 29 provides the sub-
atmospheric pressure within the box 27 to retain
the web or matrix of cut label material 31 in
contact with the outer surface of the box front
10 plate 28. As seen in Figure 3, the web 31 has
labels 32 already cut therein with adhesive having
been applied thereto. As before, the web 31 is
pulled over the box front plate 28 by a rewind roll
(not shown) to which the matrix is attached
15 downstream of a roller 33 provided at the end of
the box 27. At this end of the box 27, selected
apertures 34 in the front plate 28 are fitted with
air jets 35 which when actuated blow the label 32A
thereunder onto an article (not shown) which has
20 been brought into the vicinity in known manner.
Figure 5 shows the web or matrix 31 of label
material with cut labels 32 still retained therein
and other labels removed on being applied to
articles, having apertures 36 in the matrix.

25 The stationary support, such as the box 11,
for the cut portion of label material replaces the
previously used roller, conveyor or other movable
components, whereby the present invention dispenses
with moving parts to decrease the cost of
30 production and also the cost of maintenance of the
labelling apparatus. The embodiment of Figures 3
and 4 affords further savings in construction and
maintenance costs by dispensing with the air jet
and grid assembly, thus giving rise to a
35 significant advance in the art.

Claims

1. Labelling apparatus comprising a supply of
label material (6,31) in the form of a roll (1) of
that material, a cutter unit (2) to which the label
material (6,31) is fed from the roll (1) for labels
5 (21,32) to be cut in the label material (6,31),
stationary support means (11,27) for the cut
portion of the label material (6,31), an adhesive
applying station (15) operable to apply adhesive to
the labels (21,32) whilst the cut portion of the
10 label material (6,31) is supported by the
stationary support means (11,27), a label applying
station (16,27), means (19) for moving the cut
portion of the label material (6,31) to which
adhesive has been applied from the adhesive
15 applying station (15) to the label applying station
(16,27) over the stationary support means (11,27),
means for successively transporting articles to be
labelled to the label applying station, and means
(24,35) at the label applying station for applying
20 the labels (21,32) with adhesive thereon to the
articles.

2. Labelling apparatus according to claim 1,
comprising vacuum means (13, 29) for retaining the
cut label material (6,31) in engagement with the
25 stationary support means (11,27).

3. Labelling apparatus according to claim 1 or
2, wherein said stationary support means (11,27)
comprises a box (11,27) which is closed except for
a perforate front plate (12,28) over which the cut
30 label material (6,31) moves.

4. Labelling apparatus according to claim 3,
wherein suction fan means (13,29) is provided for
reducing the pressure within said box (11,27).

5. Labelling apparatus according to any one of
35 the preceding claims, comprising rewind means (19)
for rewinding the label material matrix (18,31)
after the labels (21,32) have been removed
therefrom.

6. Labelling apparatus according to claim 5, **0105680**

wherein said rewind means comprises a driven roll
(19) which serves both for rewinding the label
material matrix (18,31) and for transporting the
cut portion of the label material (6,31) over the
stationary transport means (11,27).

7. Labelling apparatus according to any one of
the preceding claims, wherein said label applying
station comprises a perforate grid (17,28) with
which the labels (21) or label material (31)
are(is) held in contact by vacuum pressure and air
jet means (24,35) for transferring the labels with
adhesive thereon from the grid (17,28) to an
article to be labelled.

8. Labelling apparatus according to claim 7,
comprising means (22) for separating the labels
(21) from the label material matrix (18).

9. Labelling apparatus according to claim 7,
wherein said grid (28) is part of the stationary
transport means (27) and wherein said air jet means
(35) is adapted to transfer the labels (32)
directly from the label material matrix (31) to an
article to be labelled.

10. Labelling apparatus according to any one of
the preceding claims, wherein said adhesive
applying station (15) comprises at least one jet
printer for applying adhesive to the labels
(21,32).

11. A method of applying labels (21,32) to
articles, comprising the steps of feeding label
material (6,31) from a roll (1) thereof to cutter
means (2) operable to cut labels (21,32) in the
label material (6,31), feeding the cut label
material (6,31) to stationary support means
(11,27), applying adhesive to the labels (21,32)
whilst the cut label material (6,31) is supported
by the stationary support means (11,27), feeding
the cut label material (6,31) having adhesive

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applied to the labels (21,32) over the stationary support means (11,27) to a label applying station, and applying the labels with adhesive thereon to the articles at the label applying station.

- 5 12. A method according to claim 11, which comprises maintaining the cut label material (6,31) in contact with the stationary support means (11,27) by applying vacuum pressure through a perforate support surface of the stationary support
10 means.

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Fig. 1.

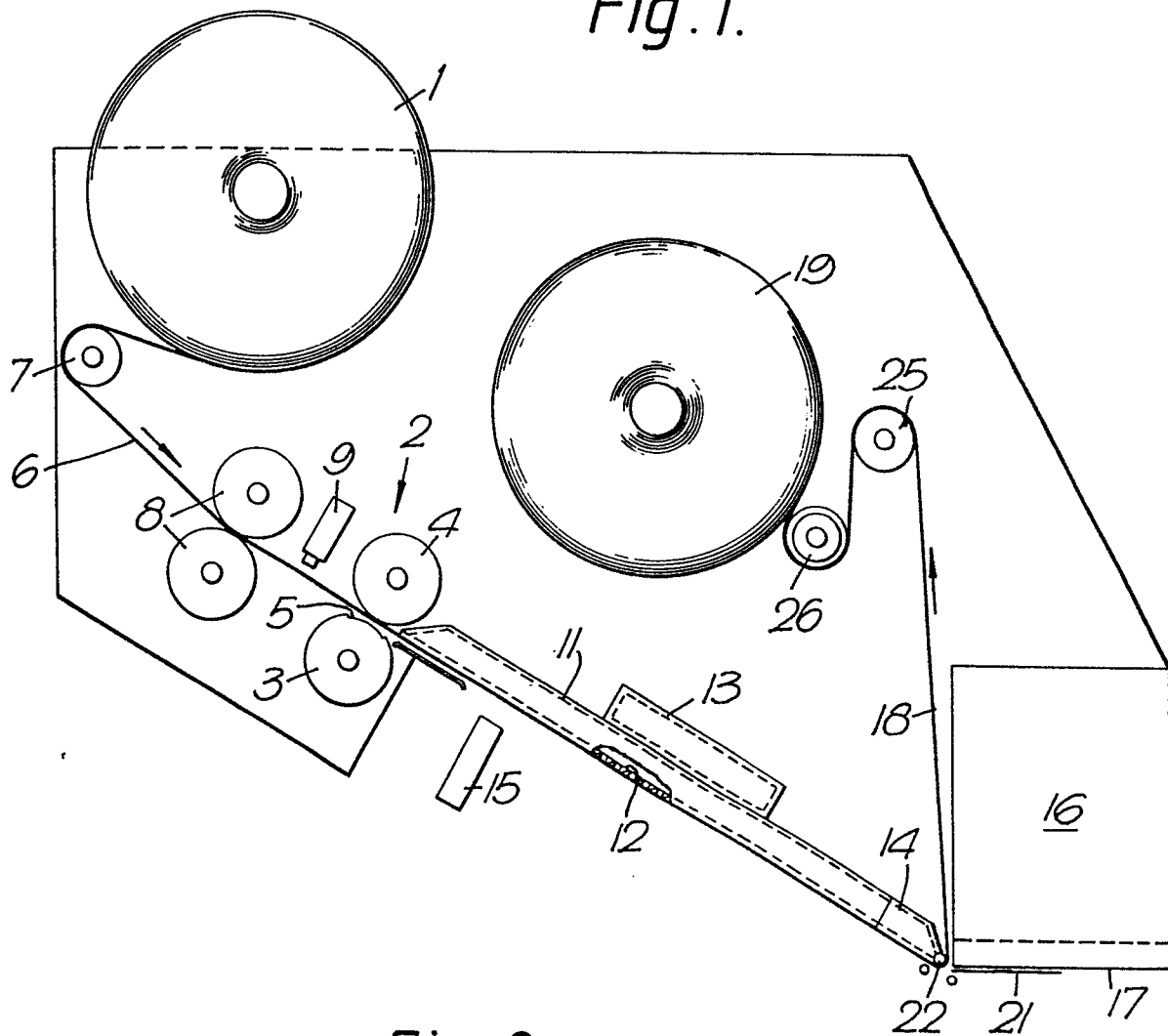
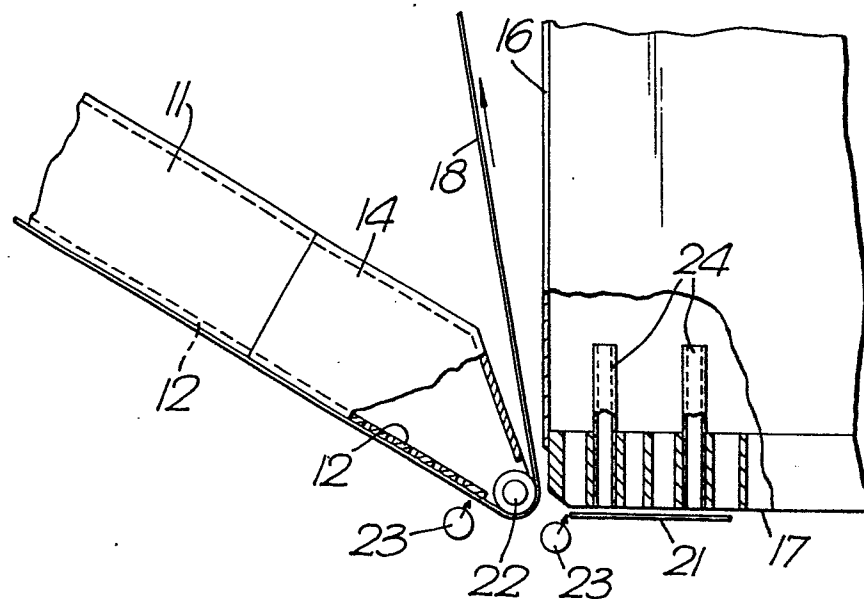


Fig. 2.



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Fig. 3.

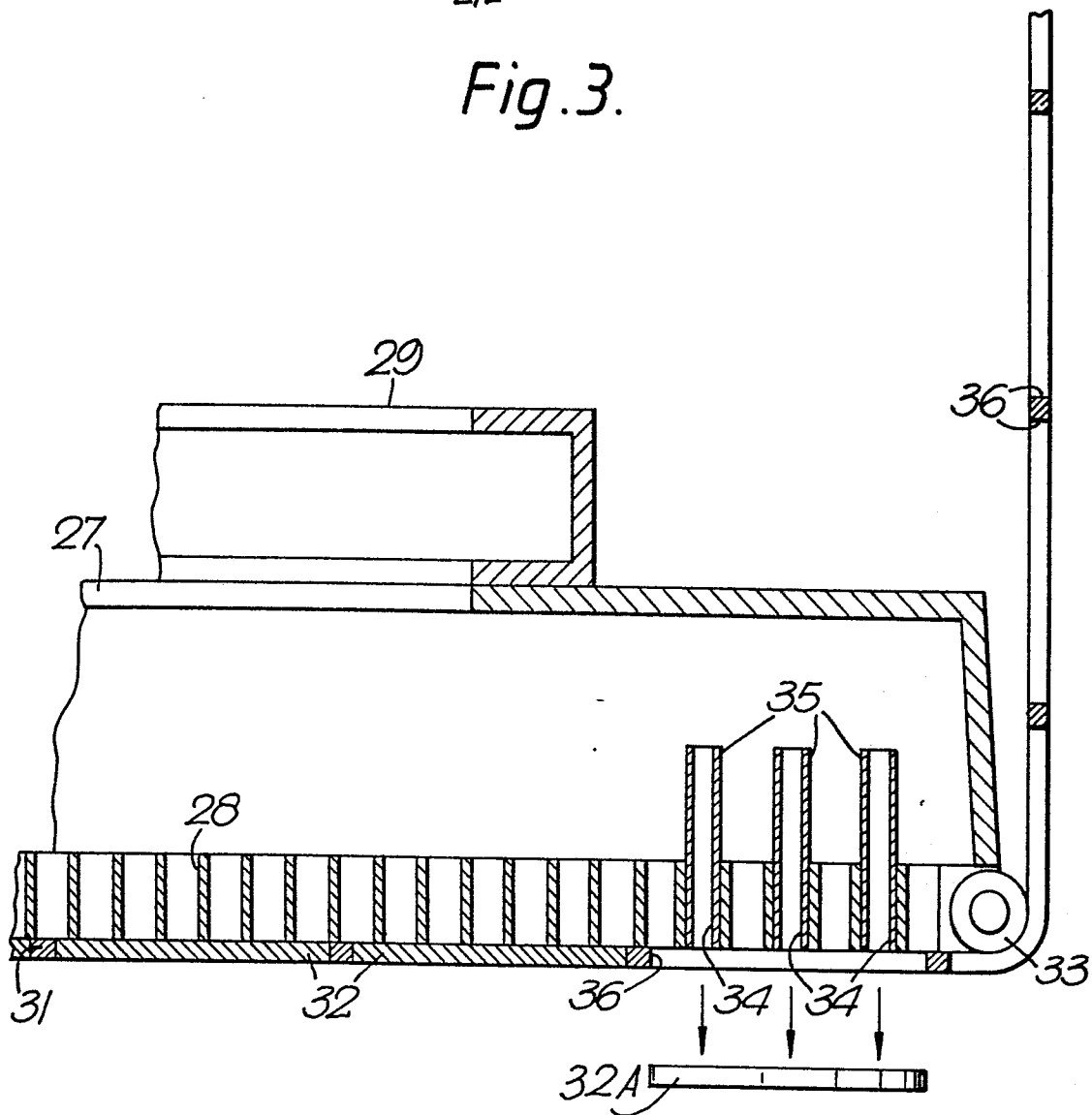


Fig. 4.

