

Method of Manufacturing Labels

The present invention relates to a method of manufacturing self-adhesive labels.

It is common to provide successive labels on a strip of backing paper, and to apply those labels using a machine which
5 peels the labels one-by-one from the backing strip and applies them to respective products. In preparing such a strip of labels, a strip of silicone coated backing paper is first provided with a coating of adhesive over a front side thereof. A labelling strip is then adhered to this side of the backing
10 paper, the labelling strip being printed with successive labels over its front surface, and then divided (typically by die cutting), to form individual rectangular labels (each label being separated from the next label by a dividing line extending across the labelling strip). The adhesive transfers
15 from the backing paper to the rear surfaces of the labels to enable each label, when removed from the backing paper, to adhere to its intended product.

I have now devised a method of manufacturing a strip of self-adhesive labels, which enables the labels to be of any
20 desired shape.

In accordance with the present invention, there is provided a method of forming a strip of self-adhesive labels, comprising providing a backing strip having a labelling strip superimposed over and secured to it, then dividing the
25 labelling strip into successive labels and waste regions, the waste regions of the labelling strip being more firmly secured to the backing strip than the labels.

Preferably the waste regions form one or more webs which extend continuously along the length of the labelling
30 strip. Thus, because the waste regions of the labelling strip are more firmly bonded to the backing strip than the labels, then the waste material may be used to help carry the labels through labelling machinery. This overcomes a common problem associated with existing label strips, which is that during the
35 label application process, the backing strip is prone to breakages. Also, the arrangement is desirable where there is

a risk of labels being inadvertently removed from the backing strip together with the waste material.

It will be appreciated by bonding the waste material to the backing strip to help carry the labels through the labelling machinery, the thickness of the backing strip may be greatly reduced. Despite this reduction in thickness of the backing strip, the combined strip remains far stronger, and therefore less prone to breakages, than would be the backing strip alone. As the overall thickness of the strip of labels is correspondingly reduced, a greater number of labels may therefore be carried on a roll of the same diameter. Thus, in a labelling plant, roll changes will be required much less frequently. In such a labelling plant, labels are applied to their intended products by removing them individually from the backing strip, leaving the waste material in place.

Preferably the successive labels are formed on the labelling strip by printing onto the rear and/or front surface of the labelling strip. Preferably adhesive is applied either to the rear surface of the labelling strip or to the front surface of the backing strip, before the labelling strip is superimposed over the backing strip. Preferably the adhesive is applied in-line with the printing process. Preferably the labelling strip is superimposed over the backing strip, in-line with the printing and adhesive-application processes. Preferably the step of dividing the labelling strip (into successive label and waste regions) is carried out in-line with the step of superimposing the labelling strip over the backing strip. The dividing step may be carried out for example by die cutting or by laser cutting.

During manufacture of the strip of labels, preferably the backing strip is coated with a release agent (e.g. silicone) over discrete portions of its surface which correspond to individual labels of the labelling strip, the release agent coating extending at least over areas of the backing strip which correspond with areas of the labelling strip which are immediately adjacent the peripheral edges of the respective labels. Preferably the areas of release agent extend beyond the peripheral edges of the labels, to provide a degree of tolerance for the die-cutting operation.

It will be appreciated that, as only a relatively small proportion of the surface area of the backing strip is coated with a release agent, the backing strip is more suitable for re-cycling.

5 In addition, or as an alternative to providing coatings of release agent, an adhesive may be applied to the waste regions of the labelling strip which is stronger than the adhesive applied to the label regions, or a solvent may be applied to the waste regions which causes these to bond to the
10 backing strip, or the waste regions may be bonded to the backing strip by a welding process, e.g. using heat and pressure, or laser welding.

 It will be appreciated that the waste regions of the labelling strip may be bonded to the backing strip over
15 discrete areas only of the waste regions.

 In another embodiment of the present invention, the front surface of each label is coated with contact adhesive so that, upon contacting an article to be labelled, the front surface of each label will adhere to that article and be peeled
20 from the backing strip. This arrangement has the advantage of allowing the labelling strip to be used in high speed continuous label application machines, which at present involve the use of hot melt adhesive applied to the labels in-line with label-application.

25 Preferably the step of coating the front surface of each label with adhesive is carried out in-line with the step of dividing the labelling strip (into successive label and waste regions). Preferably the rear surface of the backing strip is coated with a release agent (e.g. silicone) so that
30 the strip of labels may be wound upon itself. Preferably the step of coating the rear surface of the backing strip with release agent is carried out immediately prior to the step of applying adhesive to the rear surface of the labelling strip or to the front surface of the backing strip. Preferably,
35 prior to its release, each label is only partially adhered to the backing strip. Discrete areas of the rear surface of the labelling strip, which correspond to label regions, may be coated with a release agent (e.g. silicone) so that, having been released from the backing strip, there is no adhesive

carried upon the rear surfaces of the labels. In this case, the step of coating discrete areas of the rear surface of the labelling strip with silicone would preferably be carried out in-line with the step of superimposing the labelling strip over
5 the backing strip.

In each of the above embodiments, the labelling strip preferably comprises a plastics material, which is preferably transparent to enable printing applied to its rear surface to be visible, and may comprise a heat-shrinkable plastics
10 material, so that the individual labels are heat-shrinkable after their application to intended products.

Preferably the backing strip also comprises plastics material, this arrangement being desirable in that it allows the waste regions and backing strip to be simultaneously re-
15 cycled.

It will be appreciated that the individual labels which are formed may be of any desired shape.

Also in accordance with the present invention, there is provided a strip of self-adhesive labels which comprises a
20 backing strip having a labelling strip superimposed and adhered to it, the labelling strip being divided into successive labels and waste regions, the waste regions being more firmly secured to the backing strip than the labels.

Embodiments of this invention will now be described by
25 way of examples only and with reference to the accompanying drawings, in which:

FIGURE 1 is a diagram to explain one method by which a strip of labels may be formed in accordance with the present invention;

30 FIGURE 2 is a perspective view of a strip of labels formed according the method shown in Figure 1;

FIGURE 3 is a plan view of a strip of labels formed by another method in accordance with the present invention;

FIGURE 4 is a section through the strip of labels of
35 Figure 3; and

FIGURE 5 is a diagram to explain the method of forming the strip of labels shown in Figures 3 and 4.

Referring to Figure 1 of the drawings, in order to produce a strip of labels in accordance with a first embodiment

of the present invention, two strips 10, 20 of plastics material are dispensed simultaneously from respective rolls, 12, 22, the two strips being concurrently subjected to various respective processes before being brought together to form a finished strip of labels.

The first strip 10 of transparent plastics labelling material is dispensed from the roll 12 and passes through a series of printing stations 14 where one or more layers of print are applied to its rear and/or its front side.

10 In certain circumstances, it may be desirable for a first layer of print to be applied to the rear of each label, so that the print is visible from the front side of the label, the first layer of print being subsequently printed with an opaque layer and then a second layer of print being applied to
15 the opaque layer so that the second layer of print is visible from the rear side of the label, if viewed through a transparent package or container to which it is applied.

The plastics material of the labelling strip 10 preferably comprises heat-shrinkable material so that, having
20 been applied to an item, heat may be applied to a label to eliminate any wrinkles or creases in its surface.

The second strip 20 of plastics backing material is dispensed from the roll 22, and has its reverse face coated, by a coating head 24, with a release agent (preferably
25 silicone) over discrete areas corresponding to individual labels. The release agent is dried by exposure to ultra-violet (UV) irradiation at a drying head 26, before a coating of adhesive is applied to its reverse face at a station 28. The adhesive preferably comprises a contact adhesive which may
30 either completely or partially coat the reverse face of the backing strip. The adhesive is dried by passing the backing strip through an infra-red (IR) drying tunnel 29. Alternatively, the adhesive may comprise a hot melt adhesive, in which case the adhesive may be dried by exposure to ultra-
35 violet radiation.

It will be appreciated that, if the backing strip 20 were instead passed through a sufficiently long drying tunnel subsequent to the adhesive application step, then the adhesive would dry without IR or UV irradiation.

The labelling strip 10 and the backing strip 20, having been formed accordingly, are brought together at a point 30 so that the labelling strip is superimposed over and adheres to the backing strip. The labelling strip 10 is then die-cut at 5 32 to form consecutive labels within the labelling strip, before the finished strip is wound upon a roll 34.

Figure 2 illustrates, by way of example, a strip of labels formed according to the method of Figure 1, the labelling strip 10 and the backing strip 20 being brought 10 together at the point 30, prior to a label being formed in the leading portion of the labelling strip by a die-cutting tool 32.

As shown in Figure 2, the backing strip 20 is coated with release agent over successive areas 40 which correspond 15 to the peripheries of successive labels. An outer portion of each such area 40 is overlapped by the adhesive coating 42 on the backing strip 20, so that outside the silicone coated region 40, the adhesive forms a permanent bond between the labelling strip 10 and the backing strip 20, whereas the 20 adhesive within each label region is prevented from forming a permanent bond and migrates from the backing strip 20 to the reverse surface of its respective label. Thus, once separated from the remainder of the labelling strip 10 by means of cutting tool 32, an adhesive coated label L may be easily 25 removed from the backing strip whilst waste material W is retained in place.

The dashed line 33 in Figure 2 indicates a cut, made by the die-cutting tool 32, which defines the periphery of a label L. The label thus formed has an outer peripheral adhesive 30 coated region B, and a centre region having no adhesive applied thereto. It will be appreciated that the centre region of each label may be coated over one or more areas thereof, or indeed over its entire area, with adhesive, for which corresponding areas of silicone release agent would be required on the 35 backing strip.

As shown in Figure 2, the areas of silicone release agent extend beyond the periphery of their respective labels. Such an arrangement is desirable in that it provides a safeguard against any misalignment of the cutting tool 32.

The finished strip of labels is wound upon the roll 34 so that it may be subsequently unwound to have its labels removed for application to individual articles. The relative thicknesses of the adhered labelling and backing strips provide a significant advantage over existing label-bearing strips in that the continuous web of residual waste material W in the labelling strip (as opposed to the backing strip) may be used to help carry the labels through labelling machinery. A much thinner backing layer is therefore required, which results in an increased number of labels being carried upon a roll of the same diameter. When used with existing labelling machinery to which the strips are most suitable, fewer roll changes are therefore required per production run.

Also, as a strip of labels manufactured in accordance with this first embodiment of the present invention comprises less silicone release agent than conventional arrangements, then the waste material produced when applying the labels is more suitable for recycling, recycling being a particularly desirable option where the labelling and backing strips are formed of the same material so that they may be simultaneously processed.

Figures 3 and 4 show a strip of labels formed in accordance with another embodiment of the present invention, wherein the labels are intended to be applied to products in a high speed continuous process. The method of forming such a strip is shown schematically in Figure 5, in which the backing strip 50, dispensed from a roll 52, is first coated with a release agent 53 (e.g. silicone) over its front face, by a coating head 54, and this release coat is subsequently dried by exposure to ultra-violet radiation at a drying head 56. A coating of adhesive 57 is next applied to the reverse face of the backing strip at an adhesive printing station 58. The adhesive 57 covers partly or entirely those regions which correspond to respective waste regions of the labelling strip, and covers only partially those regions corresponding to individual labels themselves, such that the labels are less firmly bonded to the backing strip. If desired, a weaker (peelable) adhesive is applied in the label areas than in the waste areas. Next the adhesive is dried by passing the backing

strip through an infra-red drying tunnel 59.

Whilst the backing strip is being thus formed, a labelling strip 60 is dispensed from a second roll 62 and printed upon its front face at print stations 64.

5 The two strips 50 and 60 are then brought together at point 70 so that the labelling strip is superimposed over and adheres to the backing strip. The labelling strip is then die-cut at a station 72 to form consecutive labels within the labelling strip, and a further coating of adhesive 73 is
10 applied at a station 74 to the front surface of the labelling strip over those areas corresponding to the peripheries of individual labels. The finished strip of labels is finally wound upon a roll 76, the release coating 53 of the front face of the backing strip 50 preventing it from adhering to the
15 exposed adhesive 73 of the labelling strip 60. It will be noted from Figure 3 that the adhesive 73 at the opposite ends of the label L are interrupted: this is to align with slotted rollers over which the labelling strip runs in the label applicator machine, to avoid the adhesive coming into contact
20 with the surfaces of the rollers.

The significant advantage of the labelling strip of Figures 3 and 4 is that, in order to apply each label to its intended article, it is not necessary to first remove the label from the backing strip in order to expose its adhesive.
25 Instead, if the contact adhesive coating 73 at a leading end of a label is brought into contact with the surface of the article to which it is to be applied, then the label becomes more strongly adhered to that surface than to the backing strip so that, upon separating the strip of labels from the article,
30 the label is released from the backing strip but remains adhered to the article.

Preferably, the discrete adhesive regions which adhere the individual labels to the backing strip do not migrate to the rear of the labelling strip. This may be achieved by
35 coating corresponding portions of the rear face of each label region with release agent e.g. silicone.

Claims

- 1) A method of forming a strip of self-adhesive labels, comprising providing a backing strip having a labelling strip superimposed over and secured to it, then dividing said labelling strip into successive labels and waste regions, said waste regions of said labelling strip being more firmly secured to said backing strip than said labels.
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- 2) A method as claimed in Claim 1, wherein said waste regions form one or more webs which extend continuously along the length of said labelling strip.
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- 3) A method as claimed in Claim 1 or Claim 2, wherein said labels are formed on said labelling strip by printing onto the rear and/or front surface of said labelling strip.
- 4) A method as claimed in any preceding claim, wherein a first layer of print is applied to the rear of each label, said first layer of print being subsequently printed with an opaque layer and then a second layer of print being applied to said opaque layer.
15
- 5) A method as claimed in any preceding claim, wherein adhesive is applied either to the rear surface of said labelling strip or to the front surface of said backing strip, before said labelling strip is superimposed over said backing strip.
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- 6) A method as claimed in Claim 5, wherein said adhesive is applied in-line with the printing process.
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- 7) A method as claimed in any preceding claim, wherein said labelling strip is superimposed over said backing strip, in-line with the printing and adhesive-application processes.
- 8) A method as claimed in any preceding claim, wherein the step of dividing said labelling strip into successive label and waste regions is carried out in-line with the step of
30



superimposing said labelling strip over said backing strip.

9) A method as claimed in any preceding claim, wherein the dividing step is carried out by die cutting.

10) A method as claimed in any of claims 1 to 8, wherein
5 the dividing step is carried out by laser cutting.

11) A method as claimed in any preceding claim, in which said backing strip is coated with a release agent over discrete portions of its surface which correspond to individual labels of said labelling strip, said release agent extending at least
10 over areas of said backing strip which correspond with areas of said labelling strip which are immediately adjacent the peripheral edges of the respective labels.

12) A method as claimed in Claim 11, wherein the areas of release agent extend beyond the peripheral edges of said
15 labels.

13) A method as claimed in any preceding claim, wherein an adhesive is applied to said waste regions of said labelling strip, or to corresponding areas of said backing strip, which is stronger than the adhesive applied to said label regions.

20 14) A method as claimed in any of claims 1 to 12, wherein solvent is applied to said waste regions of said labelling strip, or to corresponding areas of said backing strip, to cause said waste regions to bond to said backing strip.

15) A method as claimed in any of claims 1 to 12, wherein
25 said waste regions of said labelling strip are bonded to said backing strip by a welding process.

16) A method as claimed in any of preceding claim, wherein said waste regions of said labelling strip are bonded to said backing strip over discrete areas only of said waste regions.

30 17) A method as claimed in any preceding claim, in which



the thickness of the labelling strip is greater than that of said backing strip.

18) A method as claimed in any preceding claim, wherein the front surface of each label is coated with contact adhesive.

5 19) A method as claimed in Claim 18, wherein said adhesive coating comprises one or more adhesive-free strips extending along the length of said labelling strip.

20) A method as claimed in Claim 18 or Claim 19, wherein the step of coating the front surface of each label with
10 adhesive is carried out in-line with the step of dividing said labelling strip into successive labels and waste regions.

21) A method as claimed in any of claims 18 to 20, wherein the rear surface of said backing strip is coated with a release agent.

15 22) A method as claimed in Claim 21, wherein the step of coating the rear surface of said backing strip with release agent is carried out immediately prior to the step of applying adhesive to the rear surface of said labelling strip or to the front surface of said backing strip.

20 23) A method as claimed in any of claims 18 to 22, wherein discrete areas of the rear surface of said labelling strip, which correspond to label regions, are coated with a release agent.

24) A method as claimed in Claim 23, wherein the step of
25 coating discrete areas of the rear surface of said labelling strip with release agent is carried out in-line with the step of superimposing said labelling strip over said backing strip.

25) A method as claimed in any preceding claim, wherein said labelling strip comprises a plastics material.

30 26) A method as claimed in any preceding claim, wherein



said labelling strip is transparent.

27) A method as claimed in any preceding claim, wherein said labelling strip comprises a heat-shrinkable material.

28) A method as claimed in any preceding claim, wherein
5 said backing strip comprises plastics material.

29) A strip of self-adhesive labels, comprising a backing strip having a labelling strip superimposed and adhered to it, said labelling strip being divided into successive labels and waste regions, said waste regions being more firmly secured to
10 said backing strip than said labels.

30) A strip of labels as claimed in claim 29, wherein said waste regions of the labelling strip form one or more webs which extend continuously along the length of said labelling strip.

15 31) A strip of label as claimed in claim 29 or 30, in which said backing strip has a coating of release agent over areas thereof corresponding to areas of adhesive by which said labels are adhered to said backing strip.

32) A strip of labels as claimed in any one of claims 29 to
20 31, wherein the front surface of each label is coated with contact adhesive.