



(19)

Europäisches Patentamt

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(11)

EP 0 876 909 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
11.11.1998 Bulletin 1998/46

(51) Int. Cl.⁶: **B32B 33/00**, B31D 1/02,
G09F 3/02

(21) Application number: **98107873.6**

(22) Date of filing: **29.04.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **05.05.1997 US 851591**

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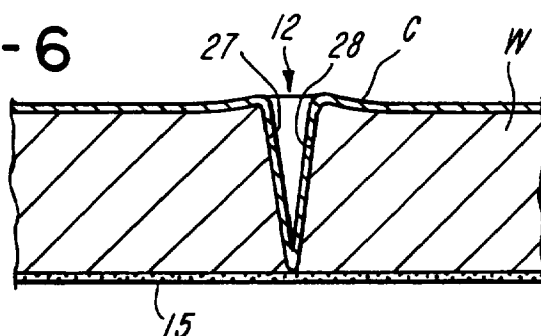
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(54) Linerless labels and method of making same

(57) There are disclosed linerless label webs and a method of making linerless labels. A linerless label web has a face side and an underside. The web has lateral perforations with cut edges and with through openings at at least some of the perforations. There is a coating of pressure sensitive adhesive on the underside of the

web. A release coating on the face side of the web preferably coats the entire face side including fibers at the cut edges. The web is slit lengthwise into narrow label webs which are wound into rolls.

FIG-6



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Description

Background of the Invention

Field of the Invention

This invention relates to linerless labels, and to methods of making linerless labels.

Brief Description of the Prior Art

In a prior art method of making linerless labels a longitudinally extending label web was perforated at longitudinally spaced transverse lines to provide lines of perforations. The underside of the label web was printed with registration marks. The underside was thereafter coated with pressure sensitive adhesive. Thereafter, a release coating such as silicone was applied to the face side of the label web. During the manufacturing process especially when the label web was under tension, the holes formed by the perforations would open up and the adhesive would migrate from the underside through the holes and would adhere to the cut edges at the perforations. Following silicone coating, the label web was slit into narrow label webs which were then wound into rolls. When the label web was subsequently unwound from the roll, the adhesive that migrated into the holes caused the web to unwind unevenly, in a jerky manner, which affected print quality when the web was printed.

SUMMARY OF THE INVENTION

It is a feature of the invention to provide an improved linerless label web and an improved method of making a linerless label web.

In accordance with a specific embodiment of a linerless label web of the invention, there is provided a longitudinally extending web of label material having a face side and an underside. There are longitudinally spaced laterally or transversely extending lines of perforations across the web, and the perforations have cut edges and through-openings at at least some of the perforations. There is a coating of pressure sensitive adhesive on the underside of the web. A release coating on the face side of the web preferably coats the entire face side including the fibers at the cut edges. After slitting the web into narrow webs, the narrow webs are wound into rolls. As the web is subsequently being used from the roll, typically in a printer, the convolutions of the web are paid out from the roll. The adhesive on the underside of one convolution adheres releasably to the release coating on the underlying convolution. Because the cut edges of the web were coated with the release coating and the adhesive was applied to the web after the perforations were made, release of the web from the roll is enhanced.

Brief Description of the Drawings

FIGURE 1 is a side elevational view of a linerless label web in roll form in accordance with the invention; FIGURE 2 is a diagrammatic side elevational view illustrating a method according to the invention; FIGURE 3 is a top plan view of the label web along line 3—3 of FIGURE 2; FIGURE 4 is a bottom plan view of the portion of the web shown in FIGURE 3; FIGURE 5 is a sectional view taken along 5—5 of FIGURE 2; and FIGURE 6 is a sectional view taken generally along line 6—6 of FIGURE 2.

Detailed Description of the Preferred Embodiment

With reference to the drawings, there is shown a roll R of a wound-up web W of linerless labels L. As shown, the web W has wraps or convolutions 9, one upon the other. The web W extends longitudinally as shown in FIGURES 3 and 4 for example and has a face side 10 and an underside 11. There are longitudinally spaced laterally extending lines of weakening caused by perforations 12 across the web. The perforations 12 are preferably made by spaced knife cuts 13 separated by uncut portions or lands 14. Thus, a label L can be manually torn from the remainder of the web W. There is a coating of pressure sensitive adhesive 15 on the underside 11 of the web W. The adhesive 15 is preferably in a uniform coating, however, the coating 11 can alternatively be of the patterned type. There is a release coating C, typically a silicone coating, on the face side 10 of the web W. There are registration marks 16 printed directly on the underside of the web W. The marks 16 are disposed between the web W and the adhesive 15. The adhesive 15 is preferably transparent or at least translucent.

With reference to FIGURE 2, there is shown diagrammatically a method by which the linerless web roll R of the invention is made. A wide web W' of label material is fed between a printing roll 17 and a back-up roll 18. The printing roll 17 prints the registration marks 16 on the underside 11 of the web W' in a longitudinal and transverse pattern. From there, the web W' passes between a perforating roll 19 and a back-up roll 20. The roll 19 makes the transverse lines of weakening, specifically perforations, across the web W'. From there the web W' passes between a release coating roll 21 and a back-up roll 22. The release coating roll 21 applies the release coating C to the face side 10 of the web W'. From there, the web W' passes between an adhesive coating roll 23 and a back-up roll 24. The adhesive 15 is thus applied to the underside 11 of the web W', however, if desired the adhesive 15 can be applied over the release coating C. From there, the web W' is slit into narrow label webs W as the web W' passes between a slitting roll 25 and a back-up roll 26. From there the nar-

row webs W are wound into the rolls R.

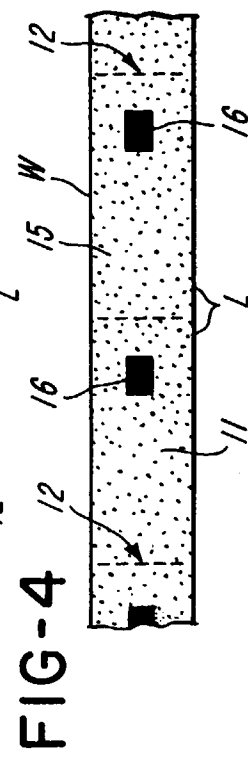
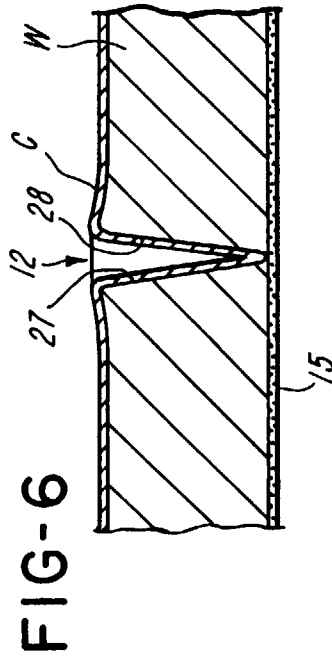
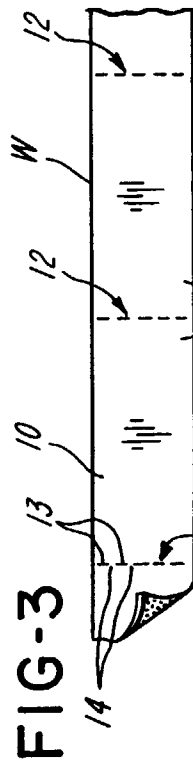
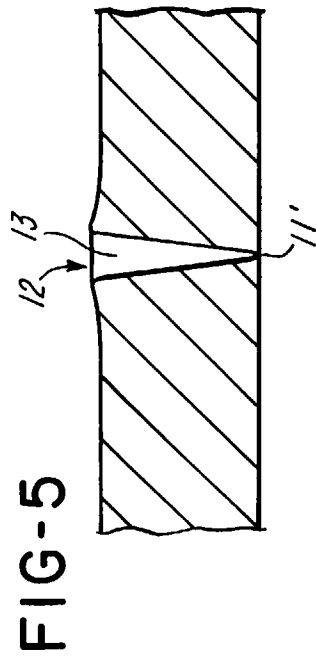
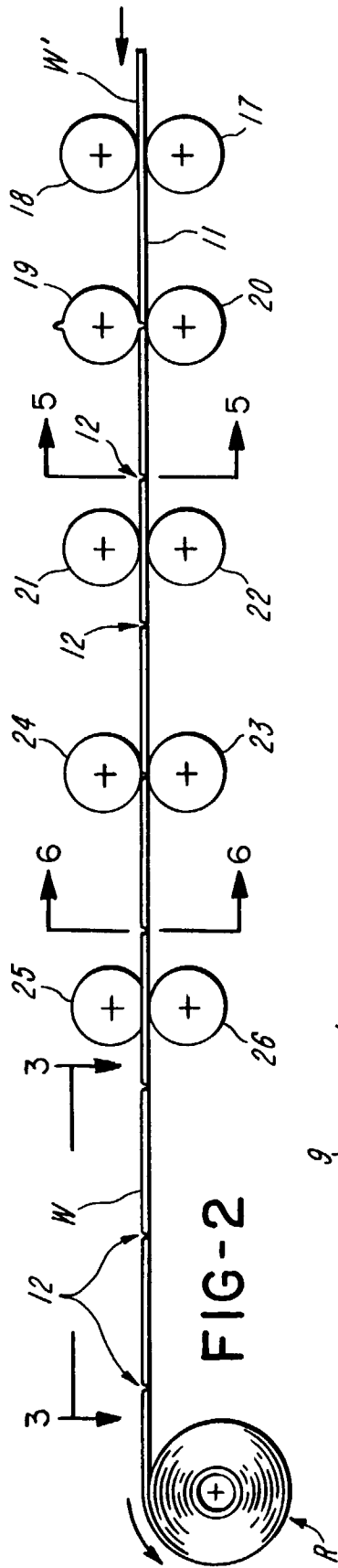
It is seen in FIGURE 5 that the perforating roll 19 makes spaced apart cuts 13 in the web W'. In a typical production environment, the depths and widths of the cuts can vary substantially. When the perforations are being cut, as by the perforating roll 19, some of the cuts 13 may be completely through the web W to provide openings 10'. Other cuts 13 may terminate short of the underside 11 and provide to a heavy score, and even in this event the cuts 13 may open up to provide openings 10' later in the production process due to web tension. In all such cases, there are exposed uncoated fibers at the cut edges. In the present invention, the release coating C covers the cut edges 27 and 28. Adhesive "cold flow" can occur when the web W has been wound into roll R. Such cold flow causes the adhesive 15 to flow into the cuts 13 including openings 10'. Because the cut edges 27 and 28 have been coated with the release coating, the adhesive 15 on the underside of one convolution of the web W releases more easily and smoothly from the cut edges of the underlying convolutions during unwinding of the roll R. This is conducive to the web W unwinding smoothly from the roll R during any subsequent processing and/or printing. A typical printer for printing on the face side 10 of the web W is disclosed in U.S. patent 5,486,259, assigned to Monarch Marking Systems, Inc. By applying the release coating C before the adhesive 15 is applied as depicted in FIGURE 2, the adhesive 15 can only releasably adhere to the coated cut edges 27 and 28.

Other embodiments and modifications of the invention will suggest themselves to those skilled in the art, and all such of these as come within the spirit of this invention are included within its scope as best defined by the appended claims.

Claims

1. Method of making a roll of linerless labels, comprising the steps of: providing a longitudinally extending web of label material having a face side and an underside, perforating the web along longitudinally spaced laterally extending lines across the web, wherein the perforating step results in exposed cut edges and in through-openings at at least some of the perforations, thereafter coating the face side of the web including the exposed cut edges with a release coating, thereafter coating the underside of the web with pressure sensitive adhesive, thereafter winding the web into a roll having convolutions, and wherein the adhesive on the underside of one convolution adheres releasably to the release coating on the underlying convolution.
2. A roll of linerless labels, comprising: a longitudinally extending web of label material having a face side and an underside, longitudinally spaced laterally extending lines of perforations across the web,

wherein the perforations provide cut edges and through-openings at at least some of the lines of perforations, a coating of pressure sensitive adhesive on the underside of the web, a release coating on the face side of the web and coating the cut edges, the web having been wound into a roll having convolutions, and wherein the coating on the cut edges enhances the release of one convolution from the underlying convolution when the roll is being unwound.





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EUROPEAN SEARCH REPORT

Application Number
EP 98 10 7873

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 5 487 915 A (TIMOTHY J. RUSS ET AL) 30 January 1996 * column 2, line 45 - column 5, line 25; claims 7,8; figures 1,2 *	1,2	B32B33/00 B31D1/02 G09F3/02
X	US 5 536 546 A (THOMAS P. NASH) 16 July 1996 * column 2, line 33 - column 3, line 6 * * column 4, line 3 - line 51; claim 11; figures 1,2 *	1,2	
A	WO 96 40526 A (MOORE BUSINESS FORMS, INC.) 19 December 1996 * claim 16 *	1,2	
A	WO 96 29271 A (MOORE BUSINESS FORMS, INC.) 26 September 1996 * claim 1; figure 1 *	1	
P,A	EP 0 783 978 A (MONARCH MARKING SYSTEMS, INC.) 16 July 1997 * the whole document *	2	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	US 5 496 605 A (GEORGE W. AUGST ET AL) 5 March 1996 * column 5, line 48 - column 6, line 56; figures 1-5 *	1	G09F B31D B32B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 August 1998	Examiner Van Nieuwenhuize, 0
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)