(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 816 058 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.01.1998 Bulletin 1998/02

(51) Int. Cl.[6]: **B31F 1/07**

(21) Application number: **97110547.3**

(22) Date of filing: **27.06.1997**

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

(30) Priority: **01.07.1996 IT MI960470 U**

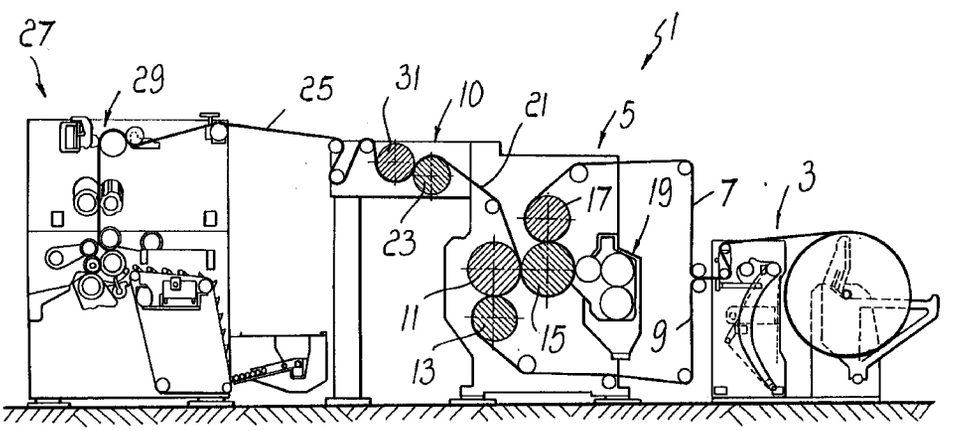
(71) Applicant:
INDUSTRIE CARTARIE TRONCHETTI SpA
I-55023 Borgo A Mozzano (Lucca) (IT)

(72) Inventor: **Tronchetti, Sauro**
55100 Lucca (IT)

(74) Representative:
Forattini, Amelia et al
c/o Internazionale Brevetti
Ingg. ZINI, MARANESI & C. S.r.l.
Piazza Castello 1
20121 Milano (IT)

(54) Embossing apparatus particularly for paper in roll form

(57) An embossing apparatus, for paper in roll form, includes a device (3) for feeding paper in roll form (7, 9) into a first embossing unit (5) constituted by at least one embossing cylinder which provides a first embossing on the paper. A second embossing unit (10), downstream of the first unit, provides a second embossing on the paper.



EP 0 816 058 A2

Description

The present invention relates to an embossing apparatus, particularly for paper in roll form for products of the "tissue" type, such as for example kitchen paper, toilet paper, et cetera.

Paper embossing machines, for example for producing two-ply composite kitchen paper rolls, generally include an unreeling device which is suitable to feed with two plies of paper an embossing unit which may be provided with a system for pasting the two plies.

The embossing unit can include two embossing cylinders, each of which has a series of protrusions arranged in parallel rows and cooperates with a respective presser cylinder to emboss each sheet.

One of the two embossing cylinders can be coated with glue in order to paste the two sheets.

The protrusions of the embossing cylinders are produced by chip-forming, or by chemical processes for removing material, so that the sheets have a uniform series of dimples constituted by parallel lines of points directed inward, that is to say, on the facing sides of the sheets.

At the exit of the embossing unit, if gluing is not provided for, there is usually a knurling unit suitable to knurl the roll in order to join the two plies.

A currently strongly felt problem is the provision of complex designs by embossing. The techniques capable of producing complex designes that have been proposed so far are not only extremely onerous but also scarcely versatile. It is in fact necessary to replace the embossing cylinders with new cylinders which bear the new design even just to provide minimal variations of the design.

An aim of the present invention is to provide an embossing machine which is suitable to provide even complex ornamental patterns on the finished product.

A further object of the invention is to provide a machine which is far cheaper to run, from the production point of view, than known systems for producing complex designs.

A further object is to provide a machine which is capable of producing ornamental patterns or designs which are more or less complicated according to the requirements and in a highly versatile manner, that is to say, with the possibility of varying the design quickly and cheaply.

This aim, these objects and others which will become apparent hereinafter are achieved by an embossing apparatus, particularly for paper in roll form, comprising a device for feeding paper in roll form into a first embossing unit constituted by at least one embossing cylinder which is suitable to provide a first embossing on the paper, characterized in that it includes a second embossing unit, downstream of the first embossing unit, and suitable to provide a second embossing on the paper.

Further characteristics and advantages will become apparent from the description of the embossing apparatus, illustrated only by way of non-limitative example in the accompanying drawing, which is a schematic lateral elevation view of the embossing machine according to the invention.

With reference to the figure, an embossing apparatus, generally designated by the reference numeral 1, includes a feeder 3 suitable to feed a first embossing unit 5. The feeder is constituted, in the illustrated example, by a reel unwinder which is suitable to feed the first embossing unit with two plies of paper 7 and 9. The first embossing unit includes a first embossing cylinder 11, with a corresponding rubber cylinder 13, and a second embossing cylinder 15, with a corresponding rubber cylinder 17. Optionally, there is a pasting device 19 which is suitable to spread glue on the cylinder 15 in order to paste the two plies 7 and 9.

A web of embossed paper 21 exits from the first embossing unit and, according to the invention, is passed through a second embossing unit 10 which is constituted by at least one embossing cylinder 31 which cooperates with a presser cylinder 23.

The cylinder 31 is made of steel and engraved and is suitable to work by contrast with the cylinder 23, which is made of smooth steel.

As an alternative, the embossing cylinder 31 is made of very hard rubber and works by contrast with the cylinder 23, which is made of smooth steel.

Advantageously, the embossing cylinder 31 is made of steel and has a nickel or fiber-reinforced plastic jacket which is suitable to support a cliche made of very hard rubber, on which the design is formed by photoengraving, laser or other known methods. The cylinder 31 works by contrast with the cylinder 23 made of steel or optionally made of a softer rubber than the cylinder 31.

This system has some important advantages: it is in fact possible to change the design on the paper in a very short time, because the jackets can be extracted in a cantilevered manner, without disassembling the cylinders. By photoengraving or laser methods, it is also possible to provide designs with high definition much more simply and cheaply than the provision of designs by conventional machining.

The ribbon 21 is thus subjected to a second embossing, which is superimposed on the first embossing provided by the first embossing unit. The web 25, which includes the second embossing and therefore the final design, exits from the second embossing unit and is fed to a re-reeling machine 27 in a per se known manner.

The head of the re-reeling machine may include a knurling device 29, which is optionally provided if, for example, the two plies are not pasted.

The machine according to the invention allows to provide complex designs and ornamental patterns. While the first embossing unit can provide a conventional geometrical pattern, the second embossing unit can in fact be used to superimpose a particular design.

In practice it has been observed that the invention achieves the intended aim and objects; it is in fact extremely simple to provide complex ornamental patterns by overlapping two separate embossings.

The machine according to the invention is extremely flexible; it is in fact possible to vary the design on the paper simply by replacing the second embossing cylinder; moreover, the second embossing unit can be easily bypassed if one wishes to emboss the paper in a conventional manner, with a simple design, due to production requirements.

In practice it has been observed that the invention achieves the intended aim and objects. The materials employed, as well as the dimensions, may of course be any according to the requirements and the state of the art.

Claims

1. Embossing apparatus, particularly for paper in roll form, comprising a device (3) for feeding paper in roll form (7, 9) into a first embossing unit (5) constituted by at least one embossing cylinder which is suitable to provide a first embossing on said paper, characterized in that it comprises a second embossing unit (10), downstream of said first embossing unit, and suitable to provide a second embossing on said paper (21).

2. Embossing apparatus according to claim 1, characterized in that said second embossing unit comprises at least one engraved steel cylinder (31) which is suitable to work by contrast with a smooth steel cylinder (23).

3. Embossing apparatus according to claim 1, characterized in that said second embossing unit comprises an embossing cylinder (31) which is made of hard rubber and works by contrast with a smooth steel cylinder (23).

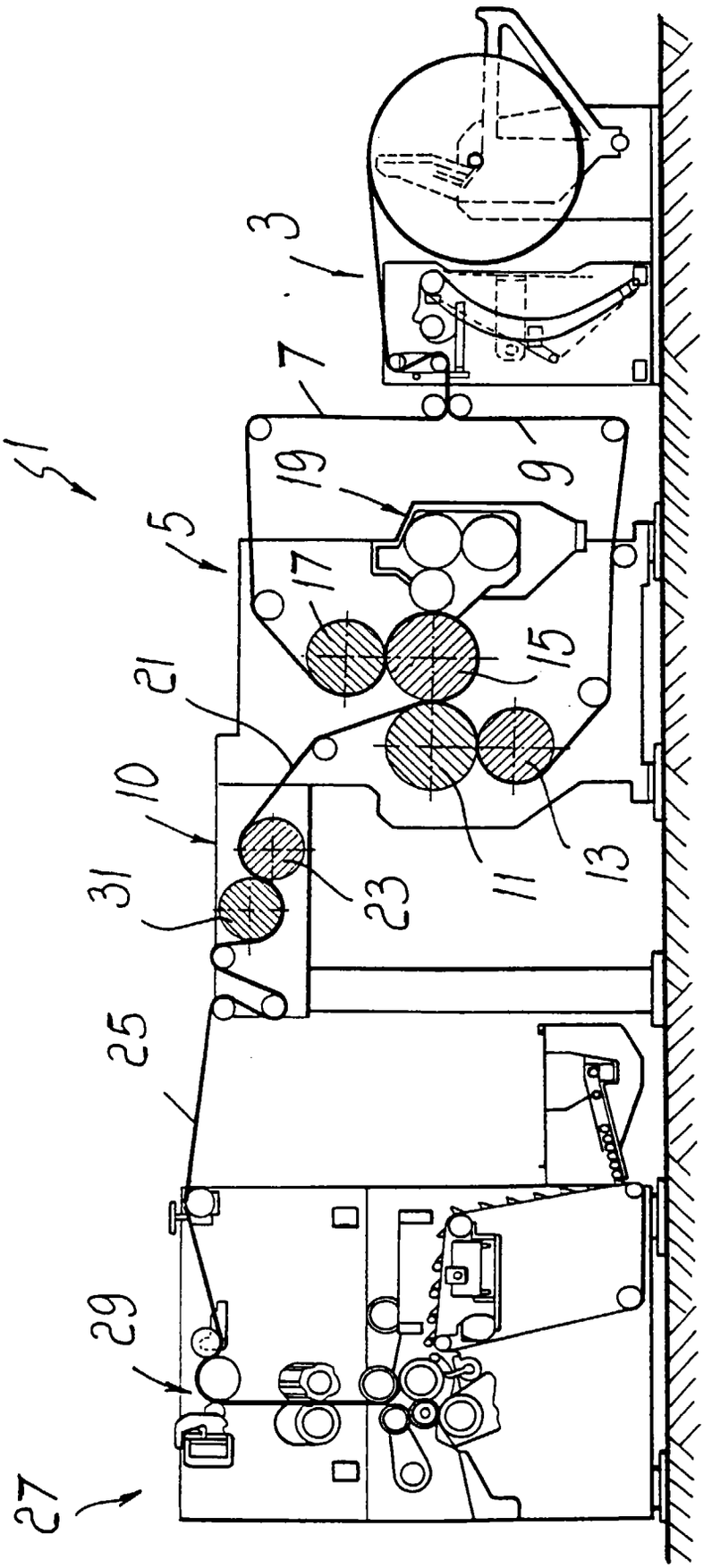
4. Embossing apparatus according to claim 1, characterized in that said second embossing unit comprises an embossing cylinder (31) which is suitable to support a jacket provided with a cliché made of hard rubber, on which a design is provided, said embossing cylinder working by contrast with a steel contrast cylinder (23).

5. Embossing apparatus according to claim 1, characterized in that said second embossing unit comprises an embossing cylinder (31) which is suitable to support a jacket provided with a relief plate made of hard rubber, on which a design is provided, said embossing cylinder working by contrast with a contrast cylinder (23) made of a softer rubber than said embossing cylinder.

6. Method for embossing paper in roll form, comprising a first operation for embossing said paper and characterized in that it comprises a second embossing operation performed over said first embossing.

7. Embossing apparatus according to one or more of the preceding claims, characterized in that it comprises one or more of the described and/or illustrated characteristics.

8. Method for embossing paper in roll form, according to one or more of the preceding claims, characterized in that it comprises one or more of the described and/or illustrated characteristics.


51
3
7
9
19
5
17
15
21
10
31
23
11
13
25
29
27