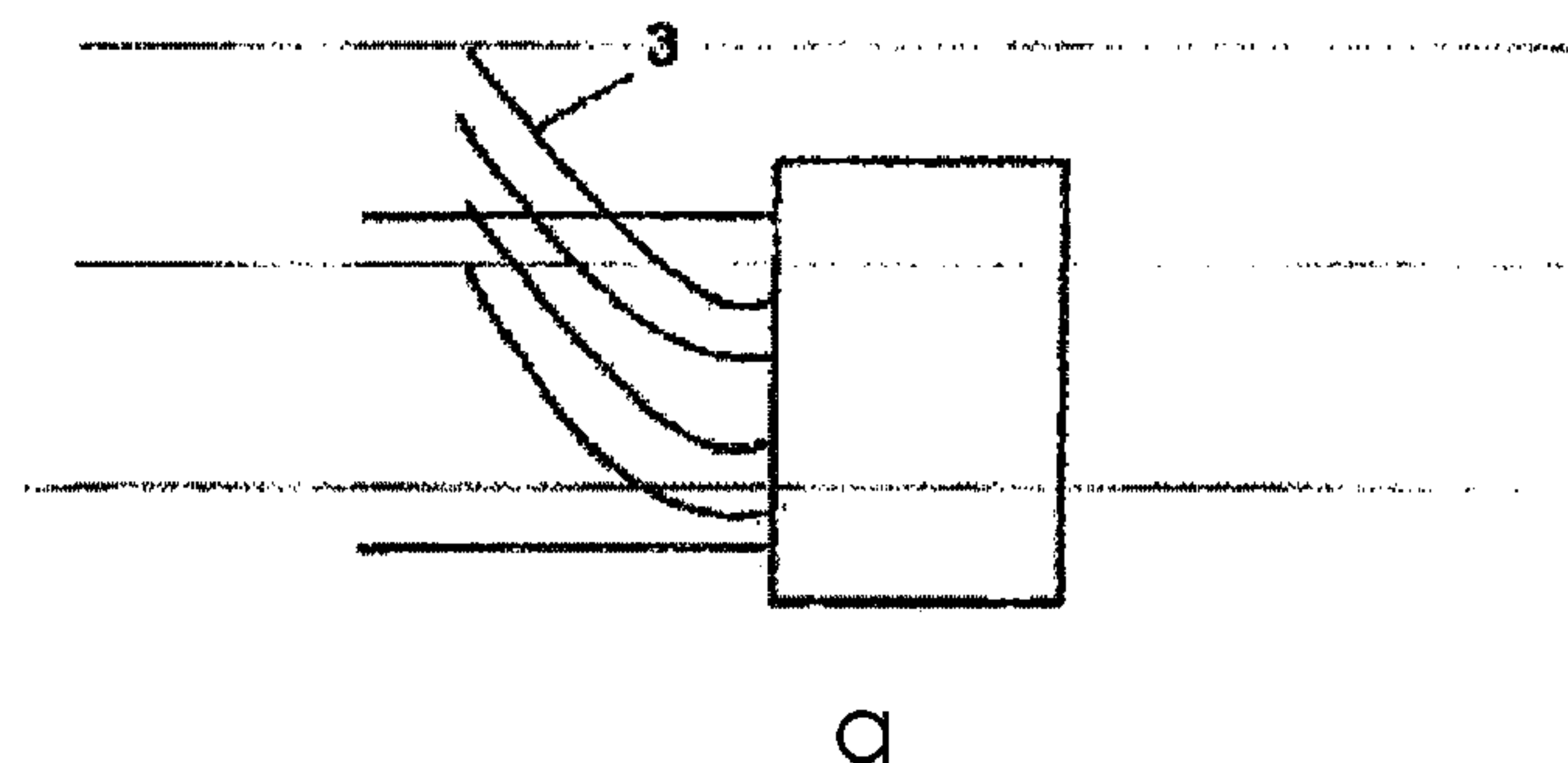
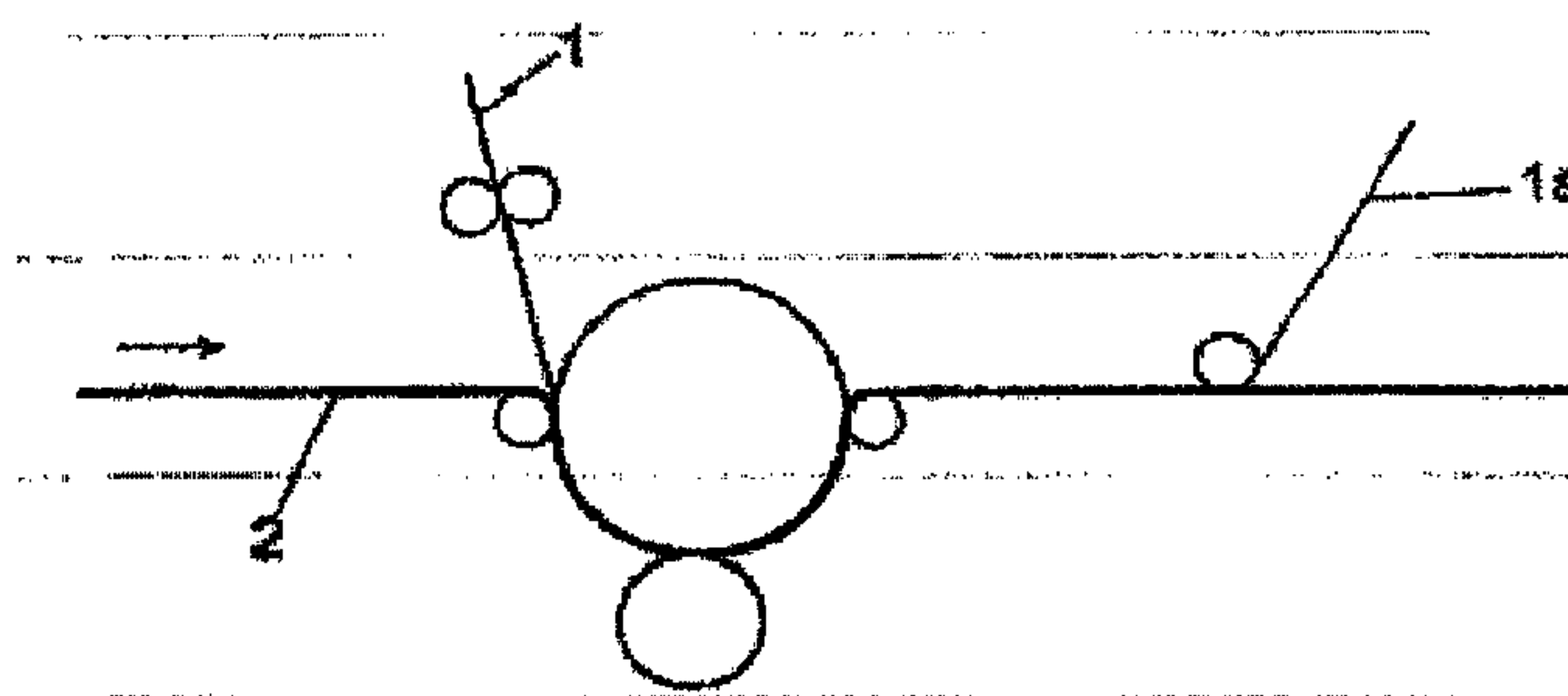




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(54) Titre : FILM D'EMBALLAGE POURVU D'UNE MARQUE DE SECURITE PARTIELLEMENT APPLIQUEE  
 (54) Title: FILM FOR PACKAGING PURPOSES, HAVING A PARTIALLY APPLIED SECURITY FEATURE



(57) **Abrégé/Abstract:**

The invention relates to films for packaging purposes, particularly even blister films, which have a partially applied security feature. The application of the security features ensues by detaching the security feature from a supporting substrate, which is provided with a UV-curable separating paint that is capable of being deep-drawn.

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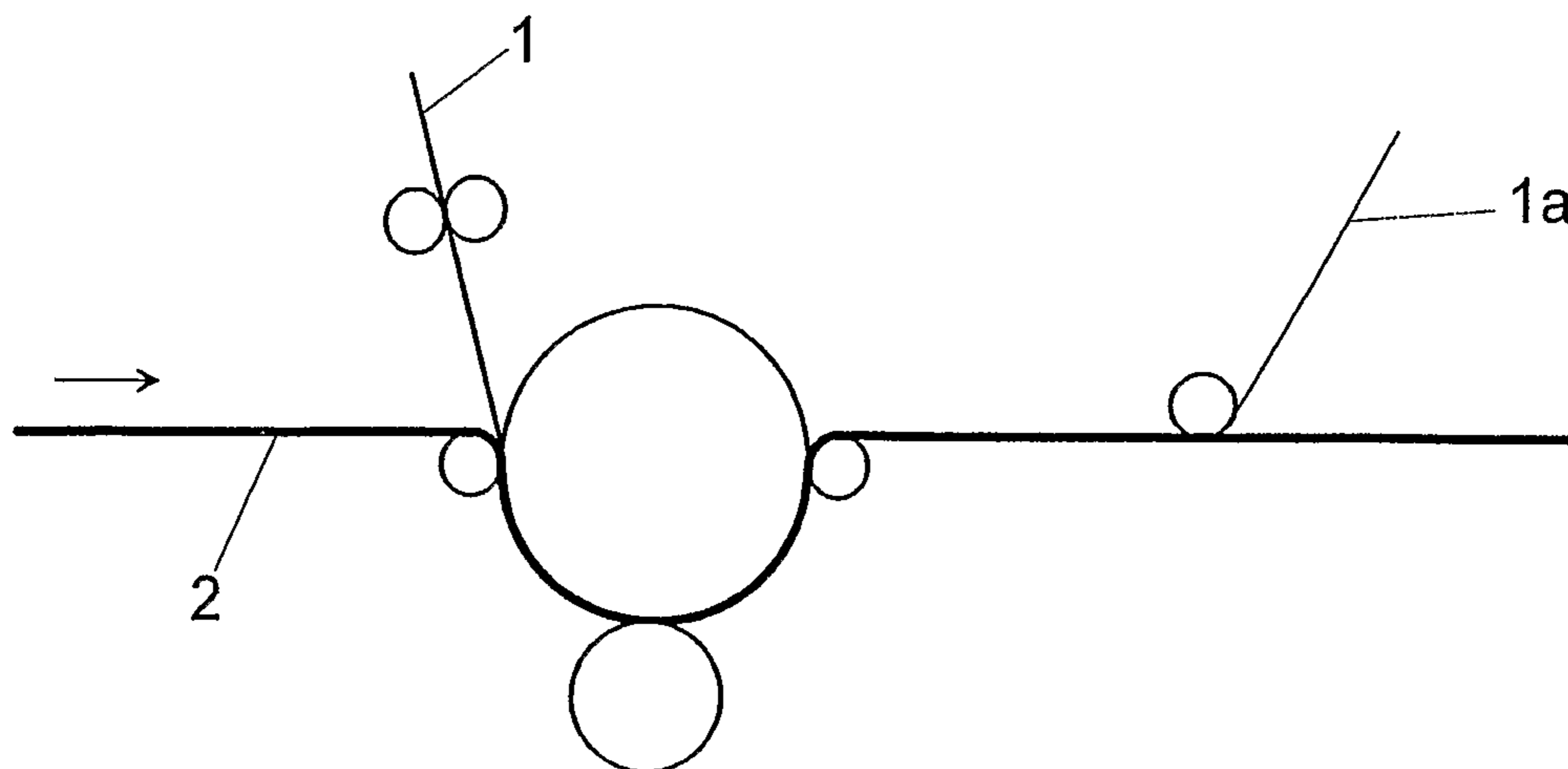
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[Fortsetzung auf der nächsten Seite]

(54) Title: FILM FOR PACKAGING PURPOSES, HAVING A PARTIALLY APPLIED SECURITY FEATURE

(54) Bezeichnung: FOLIE FÜR VERPACKUNGSZWECKE, MIT PARTIELL AUFGEBRACHTEN SICHERHEITSMERKMAL



(57) Abstract: The invention relates to films for packaging purposes, particularly even blister films, which have a partially applied security feature. The application of the security features ensues by detaching the security feature from a supporting substrate, which is provided with a UV-curable separating paint that is capable of being deep-drawn.

(57) Zusammenfassung: Die Erfindung betrifft Folien für Verpackungszwecke, insbesondere auch Blisterfolien, die ein partiell aufgebrachtes Sicherheitsmerkmal aufweisen, wobei die Applikation der Sicherheitsmerkmale unter Ablosen des Sicherheitsmerkmals von einem mit einem UV-hartbaren tiefziehfähigen Trennlack versehenen Tragersubstrats erfolgt.

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Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

## Film for Packaging Purposes, Having a Partially Applied Security Feature

The invention relates to films for packaging purposes, particularly even blister films, which have a partially applied security feature.

Packaging films with security features are used in the food, feed, pharmaceutical or cosmetic industry, as package materials in the construction industry, chemical industry, for cleaning supplies, for gardening and agricultural supplies, such as earth, fertilizer, mulch or agrarian chemicals, but also in the electronic industry, to package highly sensitive component parts.

Blister films are generally mostly used for pharmaceutical products.

To guarantee forgery security, the packaging films, especially the blister films, are provided with a security feature.

For this purpose, a transfer paint is transferred across the entire surface of a film. A high effort results from the necessity of finishing and application across the entire surface, especially if the film is only partially provided with security features.

Another known method is to provide packaging films with structures in a hot stamping process. However, during the packaging process and/or sealing process, structures produced in such a thermic process are temperature-loaded; the results are changes in the stamped structure.

It was therefore the task of the present invention to provide a packaging film, in particular a blister film with partially applied security features, especially resistant surface structures.

The subject matter of the present invention is therefore a packaging film, in particular a blister film with security features, characterized in that the packaging film, in particular the blister film, shows one or more security features applied to defined areas, wherein the application of the security features occurs by detaching the security feature from a supporting substrate, which is provided with a UV-curable separating paint that is capable of being deep-drawn.

To produce a security feature that is subsequently applied to the film, a separating paint, preferably one that is UV-curable and capable of being deep-drawn, is applied to a web-shaped substrate. Afterwards, a surface structure can be produced, for example by casting a mold into that paint, which at the time of casting is pre-hardened to gel point. After application of the surface structure, the radiation-curable paint is completely hardened.

Due to the use of the UV-curable paint, which is capable of being deep-drawn, the layers applied to it, and also, if applicable, an inserted surface structure, are stable after the hardening, even when temperature-loaded.

The radiation-curable paint can be, for example, a radiation-curable paint system on the basis of a polyester, epoxy or polyurethane system, containing 2 or more various photo

initiators familiar to experts, which can initiate a hardening of the paint system to different extents at varying wavelengths. Thus, a photo initiator can, for example, be able to be activated at a wavelength of 200 to 400 nm, and the second photo initiator at a wavelength of 370 to 600 nm. Enough difference should be maintained between the activation wavelengths of the two photo initiators to avoid a too-strong stimulation of the second photo initiator while the first photo initiator is activated. The area in which the second photo initiator is stimulated should lie in the transmission wavelength range of the applied supporting substrate. For the main hardening (activation of the second photo initiator), electron radiation can also be used.

A water-dilutable paint can also be used as a radiation-curable paint. Preferred are paint systems on a polyester basis.

The radiation-curable paint is stable up to a temperature of 250°C.

Afterwards, this layer is imprinted with features in the form of lines, marks, geometric figures, patterns, letters or grids. However, imprinting can also occur across the entire surface and/or several features can be applied in different layers; in doing so, application can occur precisely on the gauge-pins to one and/or several of the layers already on the supporting substrate, or it can also occur completely and/or partially overlapping to one and/or several already existing layers.

The so imprinted substrate is subsequently equipped with a glue layer, for example a thermo-activating glue layer, a self-adhesive layer, and can subsequently be assembled into threads, strips, bands or other formats, such as patches and similar.

Afterwards, the assembled security feature is applied and/or transferred in an application machine, for example a lamination device, which induces the assembled security features into the lamination gap or transferring gap or sealing gap before the intake via web-guiding elements.

Application is also possible via an embossing device, however.

The application of the assembled security feature can occur precisely on the gauge-pins, wherein the packaging film is preferably provided with register marks and control lines and is measured longitudinally by a preceding measuring device, for example sensors between two or more register marks, and then adjusted to the required register length between two or more actuated stretch groups. Afterwards, the fabric web is inserted register-precisely before the first printing device by a control cycle, in particular a register regulator via a register roller, wherein the side register is pre-controlled via a web control and inserted via a pivoting frame. Then, the security feature is joined with the packaging film gauge- and register-precisely.

If applicable, the packaging film can be stretched between stretch groups or shrunk to the desired length, for example by heating it with a convection dryer or IR radiator.

Preferably, the security feature is applied to the packaging film and/or blister film via a temperature-controlled roller or a plate which can be structured or unstructured, and the web-shaped supporting substrate is removed in doing so.

Furthermore, the assembled security features can also be applied in common printing devices, such as flexography or gravure printing devices with appropriate web guiding elements.

If necessary, the packaging film thus provided with one or more security features in defined areas can subsequently be further imprinted.

In one aspect, the present invention provides a packaging film with regionally applied security features, wherein the packaging film has in defined areas at least one security feature applied thereon, the application of the security feature taking place with the detachment of the security feature from a carrier substrate provided with an UV-curable deep-drawable separation lacquer comprising at least two different photoinitiators that are activated at different wavelengths.

In a further aspect, the present invention provides a method for the production of a security feature for application onto a packaging film, comprising applying a UV-curable deep-drawable separation lacquer, which comprises two or more different photoinitiators that are activated at different wavelengths, onto a carrier substrate, and subsequently applying further functional layers.

In yet a further aspect, the present invention provides a carrier substrate comprising a security feature, the substrate for use in applying the security feature to a packaging

film, the security feature comprising an UV-curable deep-drawable separation lacquer having at least two different photoinitiators that are activated at different wavelengths.

In Figures 1 and 2, the process for the application of the security feature is presented.

Fig. 1, the process step of the application is presented, in Fig. 1a, an appropriate web intake device; in Fig. 2, various application possibilities in a process for producing a blister film are presented.

In these figures, 1 means the security feature, 1 a the supporting film, 2 the packaging film, 3 the web guiding elements, 4 a stamping device, 5 the filling device, 6, 7 and 8 alternative insertion possibilities for the security element.

Due to the high temperature stability of the complete system, it is also possible to mold the film after application by deep-drawing it, for example in a bowl shape.

The packaging film can also be already imprinted before the application of the assembled security feature, depending on use; however, in doing so, a sufficient temperature

stability of the applied printing paints must be observed if the application of the security feature occurs under heightened temperature.

As web-shaped substrates, support films can be considered, for example, preferably flexible plastic films, for example made of PI, PP, MOPP, PE, PPS, PEEK, PEK, PEI, PSU, PAEK, LCP, PEN, PBT, PET, PA, PC, COC, POM, ABS, PVC. The support films should preferably show a thickness of 5 - 700 gm, preferably 8 - 200 gm, especially preferred is 12 - 50 gm.

Furthermore, paper webs with a smooth surface, such as laminated, cast-coated or varnished papers can be used as web-shaped substrates.

As a security feature, visually recognizable and/or machine-readable features can be considered.

The application of the layers can occur by any method, such as gravure printing, flexography printing, screen-printing, digital printing and similar.

The individual features can be applied across the entire surface or partially, for example in the shape of patterns, lines, letters, marks, geometric shapes, grids and similar.

To apply a feature with optical properties, pigmented or non-pigmented paint or varnish compounds can be used. All known pigments, for example pigments with an inorganic basis, such as titan dioxide, zinc sulfide, kaolin, ITO, ATO, FTO, aluminium, chromium

and silicon oxides, or pigments on an organic basis, such as phthalocyanine blue, indolizine yellow, dioxanine purple and similar, as well as colored and/or encapsulated pigments in chemically, physically or reactively drying binder systems, can be used. As dyes, 1.1 or 1.2 chromium-cobalt-complexes can be considered, for example. Solvent-free paint or varnish systems, watery and also solvent-free paint systems may be applied.

Various natural or synthetic binders can be considered as binders.

Furthermore, paints or varnishes with luminescent properties, such as phosphorescent or fluorescent, varnishes with a defined refraction index or thermochrome paints can be applied.

To apply a feature with magnetic properties, paramagnetic, diamagnetic and ferromagnetic substances such as iron, nickel and cobalt or their compounds or salts (such as oxides or sulfides) or alloys of rare earth metals such as cobalt/samarium-alloys, can be used.

Especially suitable are magnet pigment paints with pigments on a basis of Fe-oxides, iron, nickel cobalt and their alloys, barium or cobalt ferrites, hard and soft magnetic iron and steel kinds in watery and/or solvent-containing dispersions. As solvents, for example i-propanol, ethyl acetate, methyl ethyl ketone, methoxy propanol and their compounds can be considered.

Preferably, the pigments are inserted in acrylate-polymer dispersions with a molecular weight of 150,000 to 300,000, in acrylate-urethane dispersions, acrylate-styrol, nitrocellulose or OVC-containing dispersions or in solvent-containing dispersions of these kinds.

The magnetic layer can, for example, also be applied partially in the foam of a code, e.g. in the foam or a so-called bar code, which is then machine-readable, if applicable.

To apply a layer with electric properties, substances like graphite, carbon black, conductive organic or inorganic polymers, metal pigments (such as copper, aluminium, silver, gold, iron, chromium and similar), metal alloys like copper-zinc or copper-aluminium, or also amorphous or crystalline ceramic pigments like ITO, ATO, FTO and similar, can be added to the paint or varnish that is to be applied. Moreover, doped or non-doped semiconductors such as, for example, silicon, germanium or doped or non-doped polymer semiconductors or ion-conductors, such as amorphous or crystalline metal oxides or metal sulfides, can also be used as additives. Furthermore, polar or partially polar compounds such as tensides, or non-polar compounds such as silicon additives or hygroscopic or non-hygroscopic salts, can be used or added to the paint to adjust the electric properties of the layer.

Also, if necessary, transistors can be produced on the guide webs by means of printing.

A partial metal layer can also be applied as a layer with electric properties, whereby partial application can occur by means of an etching process (application of a metal layer

across the entire surface and afterwards partial removal by etching) or by means of a demetallization process.

When using a demetallization process, a solvent-soluble paint is applied in a first step (if applicable, in the form of an inverse coding); afterwards, the metallic layer is applied, if applicable, after activation of the support substrate by a plasma or corona treatment, and the soluble paint layer is then stripped off, along with the metallization in these areas, through treatment with a suitable solvent.

Furthermore, an electrically conductive polymer layer can also be applied as an electrically conductive layer. The electrically conductive polymers can be polyaniline or polyethylenedioxythiophene.

Such a layer can also act as an antenna, in which case contact surfaces for the connection of one or several microcircuits can be intended at the antenna structure.

If more information should be stored, the antenna structure can serve as a direct contact surface for common chip systems, common electronic circuits and similar.

Furthermore, printed electronic circuits can also consist of electrically conductive polymers and/or vacuum-metallized metallic layers and/or semiconductors in connection with conductive polymers.

Such a construction is particularly suitable if a blister film is to be used for example for so-called pill clocks in the pharmaceutical area.

Furthermore, other surface relief structures such as diffraction gratings, holograms and similar can also be considered as security features, wherein these structures can also be metallized or partially metallized, if necessary.

Moreover, features which show varying color effects (color tilting effect) under varying observation angles can also be applied.

These features usually consist of at least one layer reflecting electromagnetic waves, one separation layer and one layer formed by metallic clusters.

In this, a partial or full-surface layer reflecting electromagnetic waves is preferably applied first, and then one or several partial or full-surface polymer layers with defined thickness. Afterwards, a layer formed of metallic clusters, which is produced by means of a vacuum-technological process or from solvent-based systems, is applied to the separation layer.

If necessary, so-called bio markers in the form of DNA codings can also be applied.

Packaging films provided according to the present invention with security features in defined areas can be used to a particular advantage for packaging purposes requiring a high forgery security. In particular, the packaging films according to the present invention are used in the electronic industry, for data carriers, for packaging food or feed

substances or as blister films in the pharmaceutical area, for packaging drugs such as pills, coated tablets, tablets, suppositories, loose powder preparations, granulates, for strip packages, infusion bottle stoppers and ampoule stoppers and similar.

## Patent Claims:

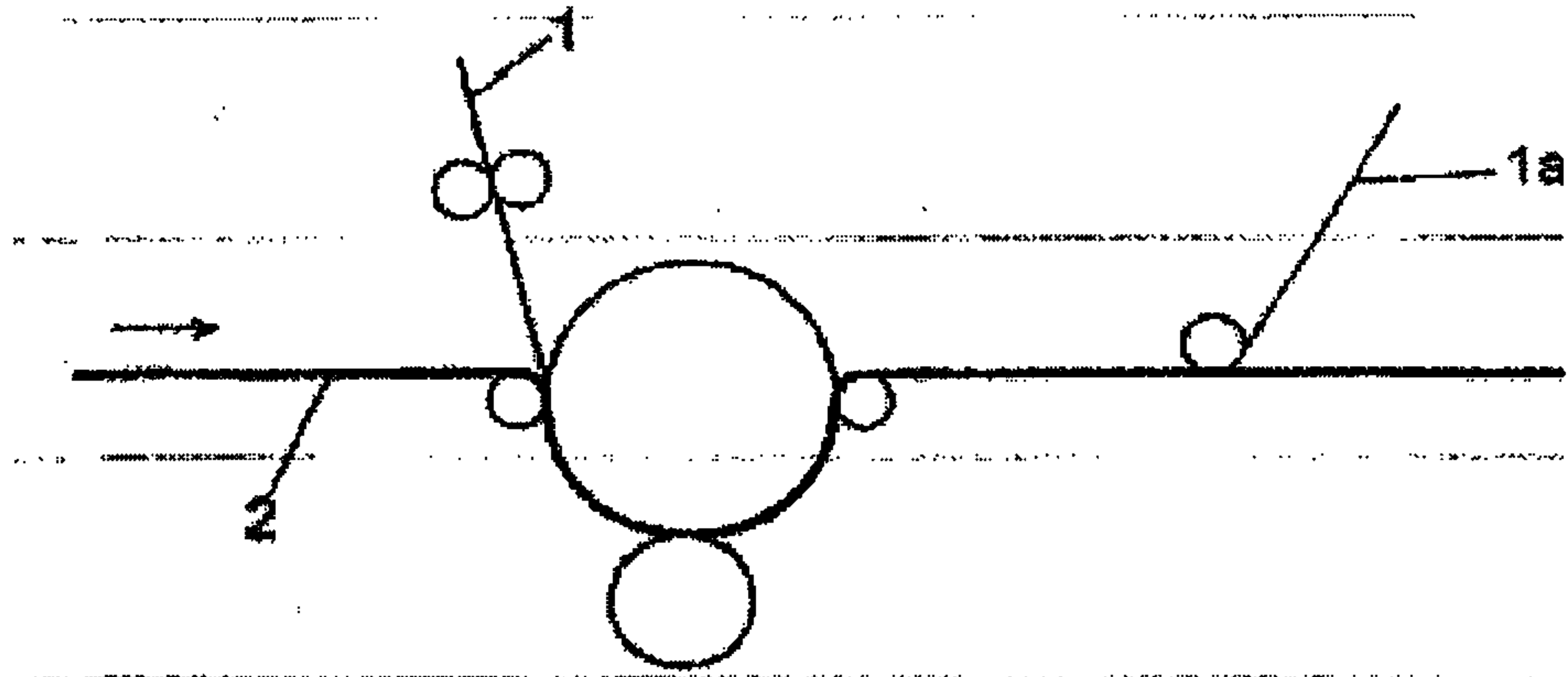
- 1) A packaging film with regionally applied security features, wherein the packaging film has in defined areas at least one security feature applied thereon, the application of the security feature taking place with the detachment of the security feature from a carrier substrate provided with an UV-curable deep-drawable separation lacquer comprising at least two different photoinitiators that are activated at different wavelengths.
- 2) The packaging film according to Claim 1, wherein the security feature has a surface structure stamped into the UV-curable deep-drawable separating lacquer.
- 3) The packaging film according to Claim 2, wherein the surface structure is one of metallized and partially metallized.
- 4) The packaging film according to any one of Claims 1 to 3, wherein the security feature has at least one layer having properties selected from at least one of optic, electric and magnetic properties.
- 5) The packaging film according to any one of Claims 1 to 3, wherein the security feature has at least one layer having properties selected from at least one of luminescent and thermochrome properties.
- 6) The packaging film according to Claim 4, wherein the security feature has at least one further layer having properties selected from at least one of luminescent and thermochrome properties.

- 7) The packaging film according to any one of Claims 1 to 3, wherein the security feature has at least one layer having at least one of a color tilting effect and bio markers.
- 8) The packaging film according to Claim 6, wherein the security feature has at least one further other layer having at least one of a color tilting effect and bio markers.
- 9) The packaging film according to any one of Claims 1 to 3, wherein the security feature has at least one layer which, independently of other functional properties, has, partially or across an entire surface, at least one of patterns, lines, letters, marks and geometric shapes.
- 10) The packaging film according to any one of Claims 1 to 9, wherein the security feature also has a glue coating.
- 11) The packaging film according to any one of Claims 1 to 10, wherein the packaging film is a blister film.
- 12) The packaging film according to any one of Claims 1 to 10, wherein the packaging film is a cold-forgeable film.
- 13) The packaging film according to any one of Claims 1 to 10, wherein the packaging film is a film for strip packages.
- 14) A method for the production of a security feature for application onto a packaging film, comprising applying a UV-curable deep-drawable separation lacquer, which comprises two or more different photoinitiators that are activated at different

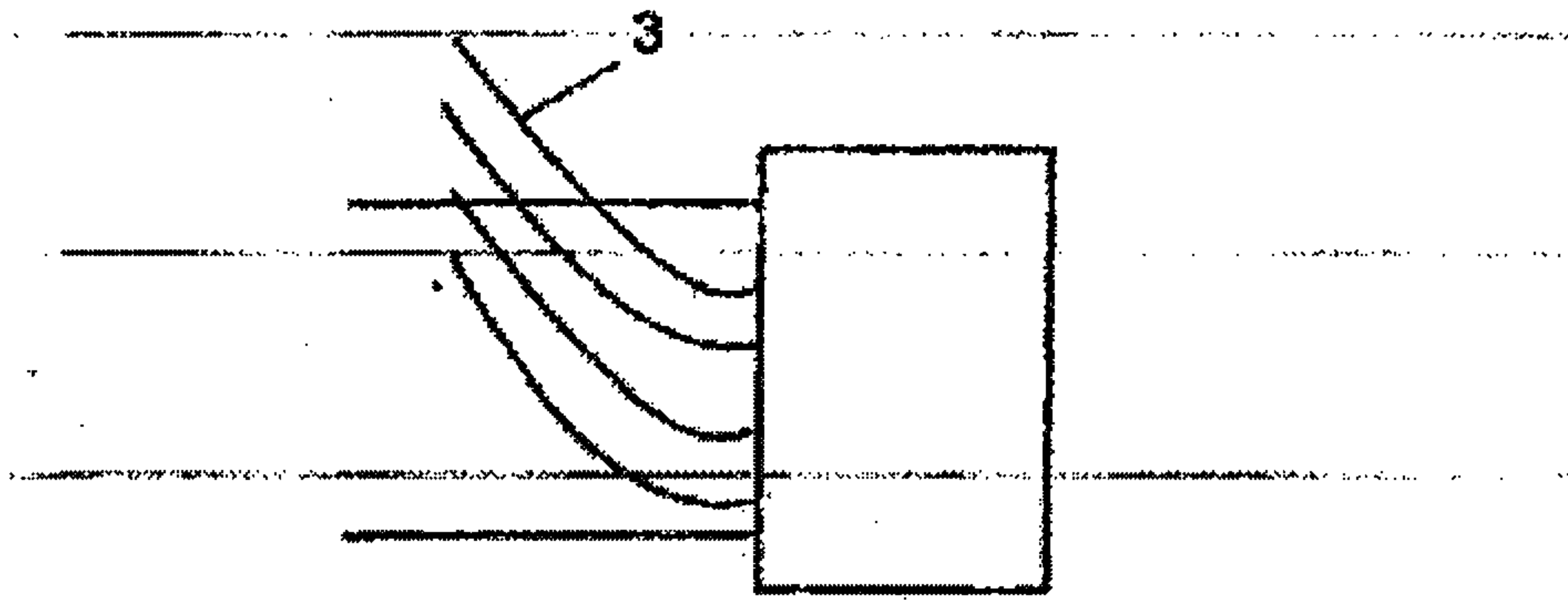
wavelengths, onto a carrier substrate, and subsequently applying further functional layers.

- 15) The method according to Claim 14, further providing the UV-curable deep-drawable separation lacquer with a surface structure by impressing a mold into the lacquer, which at the time of impression is pre-hardened to gel point, and that the lacquer is then hardened completely.
- 16) The method according to Claims 14 or 15, further applying at least one additional functional layer and a glue coating in a manner precise to gauge-pins.
- 17) The method according to any one of Claims 14 to 16, wherein the security feature is subsequently assembled.
- 18) The method according to Claim 17, wherein the assembled security feature is inserted into a laminating device via web guiding elements before intake and joined with the packaging film.
- 19) The method according to Claim 18, wherein the assembled security feature is inserted into a lamination gap via a temperature-controlled roller.
- 20) The method according to Claims 18 or 19, wherein the packaging film provided with the security feature is afterwards molded by deep-drawing.
- 21) Use of the packaging films according to one of Claims 1 to 11 for packaging purposes which require a high forgery safety.

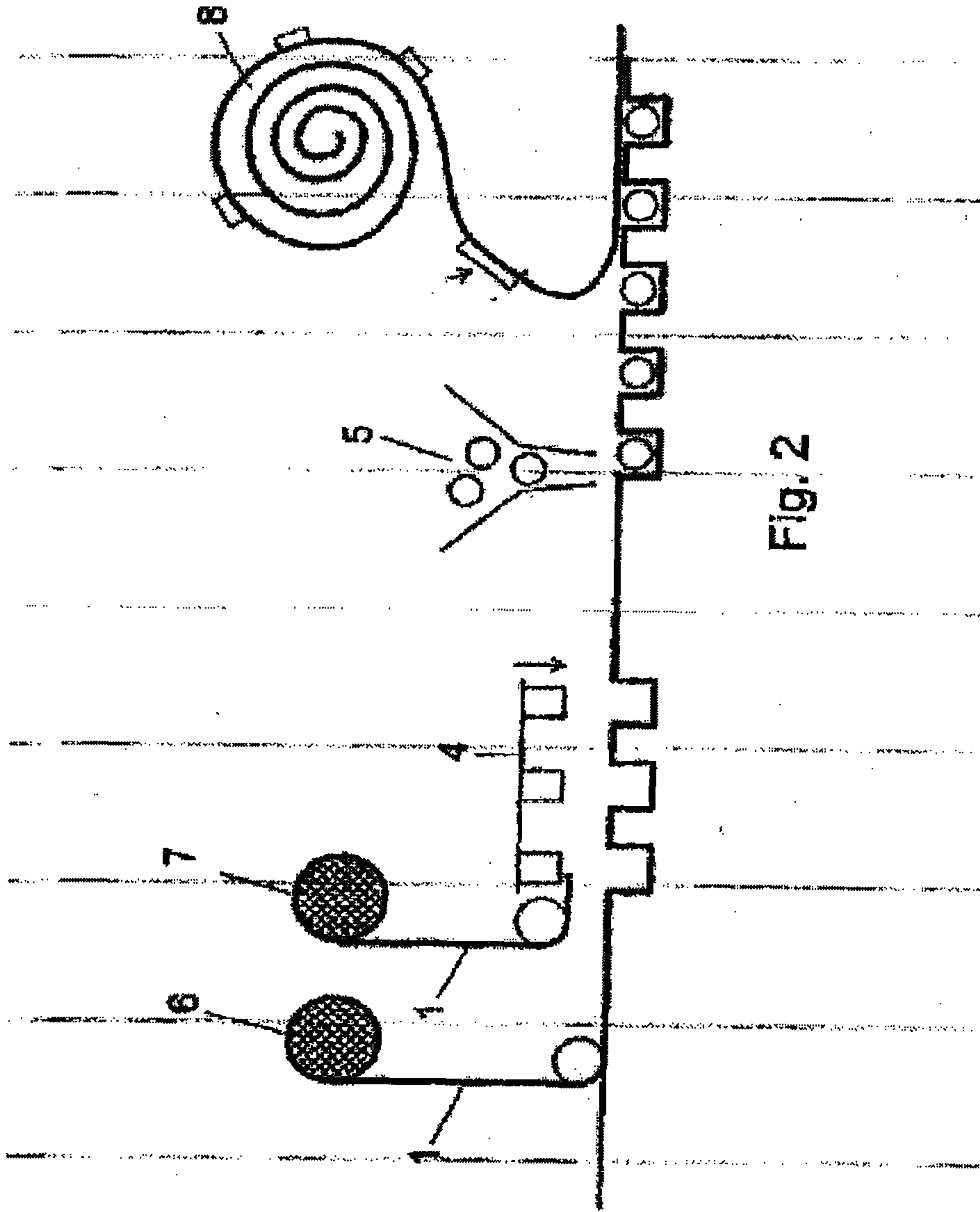
- 22) Use of the packaging films according to any one of Claims 1 to 11 for packaging in at least one of electronic industry, for data carriers, for packaging food or feed substances, as blister films in the pharmaceutical area for packaging drugs and pills, coated tablets, tablets, suppositories, loose powder preparations, granulates, for strip packages, infusion bottle stoppers and ampoule stoppers.
- 23) A carrier substrate comprising a security feature, the substrate for use in applying the security feature to a packaging film, the security feature comprising an UV-curable deep-drawable separation lacquer having at least two different photoinitiators that are activated at different wavelengths.
- 24) The carrier substrate according to Claim 23, wherein the security feature has a surface structure stamped into the UV-curable deep-drawable separating lacquer.
- 25) The carrier substrate according to Claim 24, wherein the surface structure is one of metallized and partially metallized.
- 26) The carrier substrate according to any one of Claims 23 to 25, wherein the security feature has at least one layer having properties selected from at least one of optic properties, electric properties, magnetic properties, luminescent properties and thermochrome properties.
- 27) The carrier substrate according to any one of Claims 23 to 26, wherein the security feature has at least one layer which, independently of other functional properties, has, partially or across an entire surface, at least one of patterns, lines, letters, marks and geometric shapes.

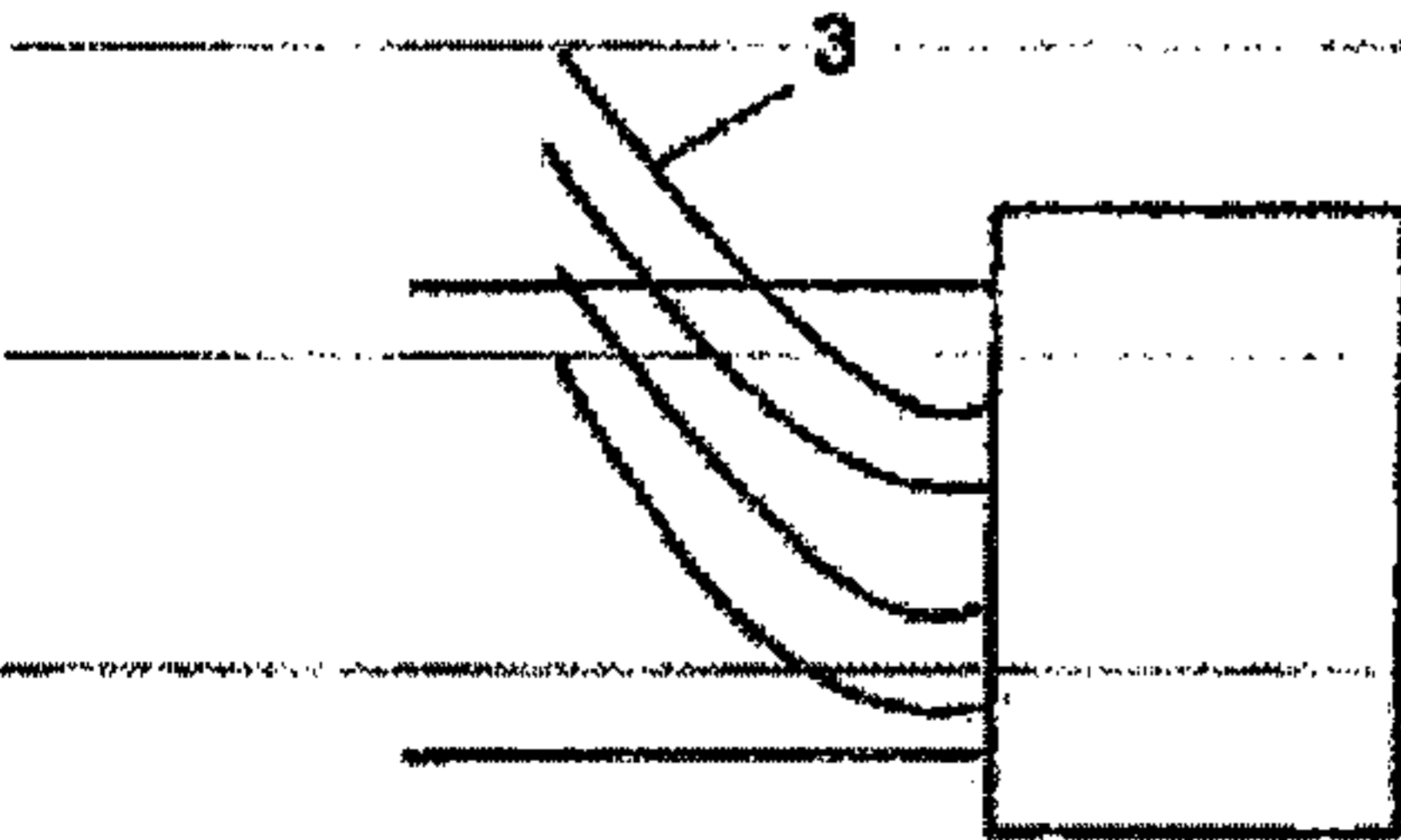
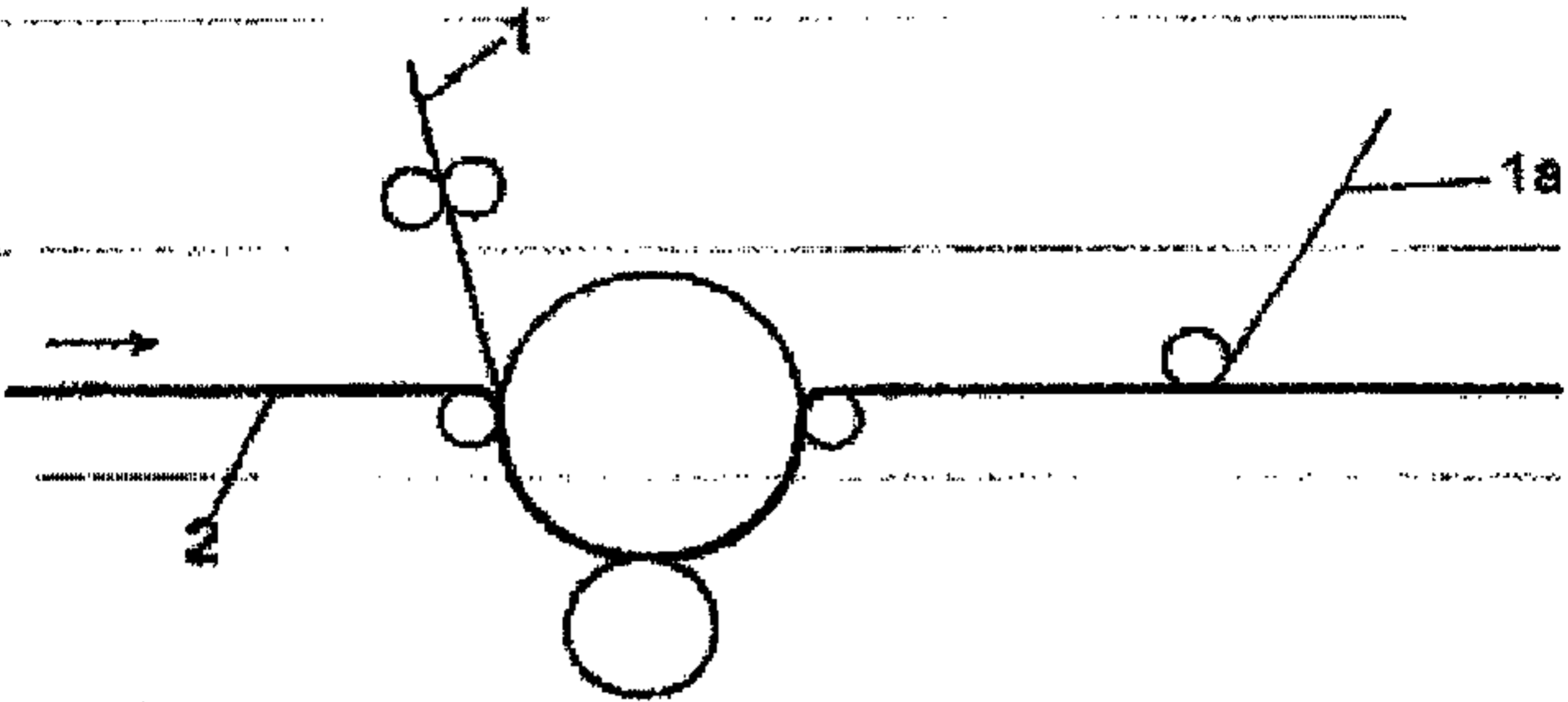


**Fig. 1**



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